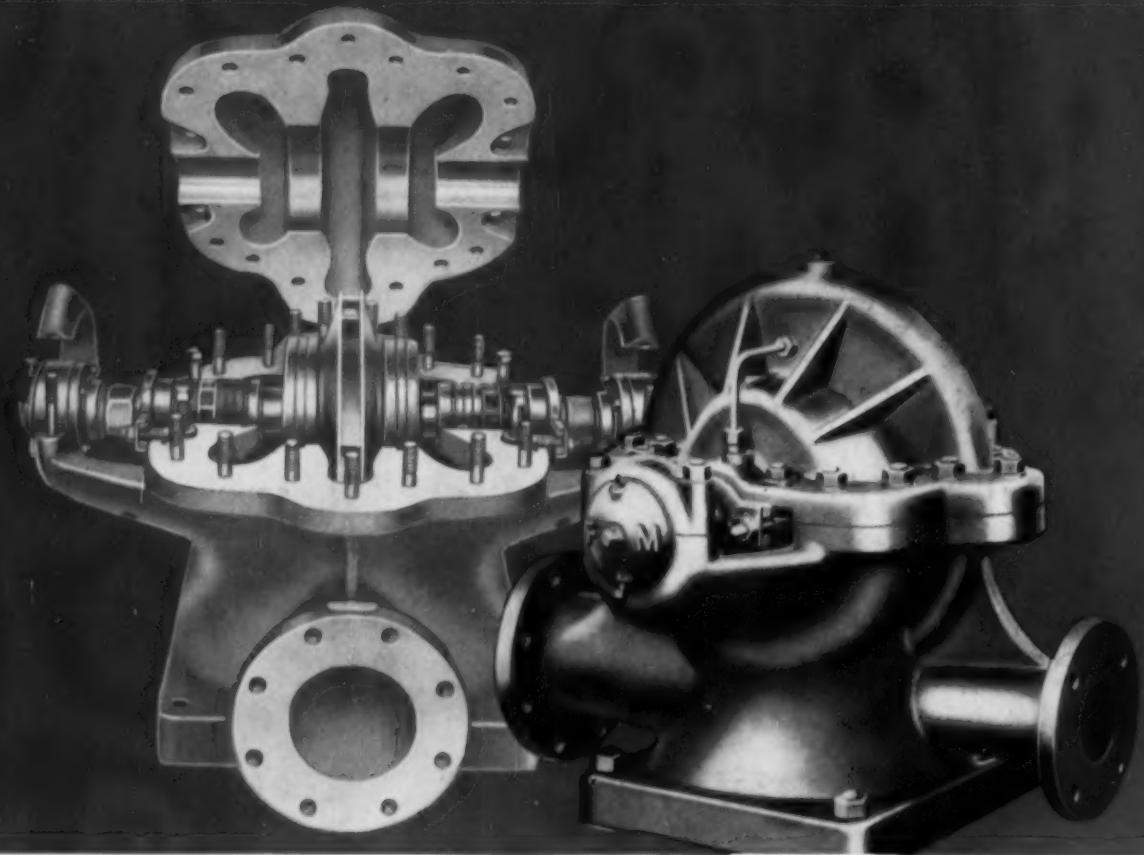


THE NATIONAL METALWORKING WEEKLY • MARCH 3, 1955



out of the mouth of a pump...

Suppose a pump could "spill its works" . . . tell you how it was made . . . speak of the design, material, workmanship that went into its being . . . then you could know . . . and buy with confidence.

Because after all, pumps do look very much alike. How, then, to tell which make is best for you. *Reputa-*

tion is one way, *performance* another.

And, on both counts, Fairbanks-Morse pumps stand out. Don't take our word for it. Check with Fairbanks-Morse users. We'll stand by their verdict. For Fairbanks-Morse has only one standard . . . *quality* . . . the quality that means dependability, service, low maintenance, all

those important points that you want in the pumps you buy.

To get these advantages in your pumps, rely on the world's largest manufacturer of a complete pump line. See your nearest Fairbanks-Morse Branch, pump dealer, or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.



FAIRBANKS-MORSE

a name worth remembering when you want the best



A PINCH OF LEAD FOR FAST, CLEAN CUTTING

Lead added to Aristoloy Steels acts as a lubricant and reduces friction between tool face and chip. It also produces a better chip formation, allowing higher machining speeds to be employed. Many users report improved machinability ratings, up to 100 for leaded steels as compared to 60 or 70 for the same material unleaded.

Better finish and longer tool life are additional benefits. Heat treating and mechanical characteristics remain unchanged.

Call your local representative or write today regarding application of leaded Aristoloy to your product.

ARISTOLOY
STEELS

COPPERWELD STEEL COMPANY
(STEEL DIVISION) WARREN, OHIO



BALL STUD

Use of 8640 Leaded improved automatic screw machine production nearly 40% for a large job shop. Production per machine hour increased from 108 to 150 pieces.



SPUR GEAR

A machine tool manufacturer cut machining time $\frac{1}{2}$ by switching to Aristoloy 4140 Leaded. And finish was greatly improved—from FAIR to EXCELLENT.



SPIRAL GEAR

Machinability was increased 25% when Aristoloy 4140 Leaded was substituted for non-leaded AISI equivalent. Biggest saving from a cost standpoint was a 75% improvement in tool life.

SEND FOR FREE
BOOKLET ON LEAD-TREATED ALLOYS





He puts "oomph" into steel sheets

Keeping a watchful eye on the sheet as it squeezes through the rolls is Duke, temper-mill roller at our Lackawanna Plant. Duke's job is to skin-pass the sheet through the temper mill to give it "oomph"—the exact temper and surface finish it will need for subsequent drawing operations.

When the newly-annealed steel enters his mill, it is soft and limp, and buckles or wrinkles at the drop of a hat. This means that the proper tension for rolling must be maintained at all times. Then too, the mill must be precisely set to reduce the thickness about 0.5 pct, or slightly more, depending on the customer's requirements for gage and temper.

On top of all that, Duke knows that his temper mill is the last step in the actual making of sheets. Thus all the quality control built in by other members of the team in the preceding steps is riding on this final operation.

It takes crack men like Duke to turn out mile upon mile of top-quality sheets. And at our Lackawanna and Sparrows Point plants, you'll find just such men all along the line, from slab-heating furnace to shipping platform. Men who get real satisfaction from doing good work; men with the will to produce the finest hot-rolled and cold-rolled sheets made anywhere.

A team imbued with that attitude, given the best tools money can buy and the best steel we know how to make, will give you a good product, every time. That's why you can look to Bethlehem for sheets that, at the very least, compare favorably with the best the industry is making. Sheets that are as finely finished, as easy forming, as true to gage, as any on the market. Sheets as fine as you can buy!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM SHEETS



Vol. 175, No. 9, March 3, 1955

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NEWS DEVELOPMENTS

INVENTORY BUILDING HOLDS STEEL DEMAND — P. 75

Steel consumers are now paying penalty for overcautious inventory policy. Surge in steel demand caught many in short position. They are making some progress in rebuilding stocks but find the job more difficult due to own higher production level and competition from other users. Inventory-building may be big factor in sustaining steel production in last half.

CONGRESS IS BIGGEST ROAD PROGRAM HURDLE—P. 78

Most people agree to the necessity for the President's proposed road program. But Congressmen don't agree on how it should be financed. This will be the top problem in getting the plan adopted. Industry knows it has the capacity to handle the program, since there are no serious shortages that can't be licked in time. Now roadbuilders and their suppliers want to know how to get their share of the work.

REDS LIFT CURTAIN ON AUTO EXPORTS — P. 81

Russians will export an estimated 40,000 cars to West in 1955. Quota was only 7300 last year. Reds need trucks however and will keep their 250,000 production behind the Curtain. West Germans lead European auto production with probably 1 million vehicles for 1955. They can cut their prices to match Reds'.

GIVES SOUTH AMERICAN SLANT ON EQUIPMENT—P. 84

J. R. Patterson, vice-president of Mackintosh-Hempill, has just returned from a 2400-mile tour of South America. In an exclusive IRON AGE interview, he tells that U. S. equipment manufacturers aren't doing too well in South America. They like our machines, but dollar shortages and credit limits shy them away! They get easier terms from Europeans.

DEMOCRATS TRY HAND AT BEING SANTA CLAUS—P. 89

Drive for a \$20-per-person income tax cut by Democrats is a flagrantly undisguised political maneuver designed to influence voters in '56. This is no time for a tax reduction. But self-righteous cries of irresponsibility by Republicans has a phony ring. They planned a tax cut of their own next year.

ENGINE PLANT HAS BUILT-IN SAFETY FACTOR—P. 92

The new Chevrolet V-8 plant is automated—but to prevent possible lengthy downtime there's a by-pass line of conventional machines to take over production if there are breakdowns in the complex automated equipment. A large stock of partly machined blocks is held ready for shunting down this "safety factor" line. Engines balanced by electronic brain.

IN METALWORKING

ENGINEERING & PRODUCTION

HIGH-PRODUCTION BUMPER PLATING LINE — P. 115 Oldsmobile's new bumper chrome plating line is efficient, precise and dependable. It features numerous devices to minimize handling while producing quality finishes. Dial settings route conveyor carriers to various destinations. Transfers between conveyors, or from conveyor to stations, are completely automatic. Racks remain fixed in single cells during plating.

ELECTROLYTIC SALT DESCALING STAINLESS — P. 119 Electrolytic salt descaling permits processing all grades of stainless strip in a single continuous annealing and pickling line. A unit at Atlas Steels, Ltd. handles straight chrome or chrome-nickel grades which have been hot or cold rolled, box or continuous annealed. Setup uses two descaling pots: One oxidizes scale and the other dissolves it. This minimizes handling, saves costs and space in handling two strips.

HARD FACING ALLOY EXTENDS PART LIFE — P. 122 Coating hydraulic pump plungers with a hardfacing alloy cuts maintenance costs on an extrusion press. Plunger life is lengthened, pump needs less packing attention. Alloy is powdered boron-nickel-chrome.

COLLOIDAL GRAPHITE HELPS FOUNDRIES — P. 124 Sprayed coatings of colloidal graphite on chills in sand or permanent molds help produce dense structures and smooth surfaces for nonferrous castings. Diecasting shops use these dispersions to coat cores, dies, pins, etc. Other applications extend to lubricating ingot molds, ladle cranes, swivels, oven car wheels.

TRANSFER UNITS MACHINE, WEIGH PISTONS — P. 128 Two new multi-station, transfer-type machines handle Chrysler pistons through semi-finish and finishing operations. Automatic machining, gaging and weighing operations are separated by some idle transfer stations, leaving room for possible future changes. Production per sq ft of floor space is unusually high. Setup features worker safety, is easy to maintain.

NEXT WEEK:

GOOD GEARS ARE NO ACCIDENT, REQUIRE PLANNING To produce top quality precision gears takes careful planning, meticulous attention to manufacturing details. First step is to get gear material to close specifications. forgings must have uniform density, stemming from correct grain size and analysis. Forging at controlled temperatures is important to quality.

MARKETS & PRICES

STEELMEN SEE NEW BAR RECORD IN MARCH — P. 77 Producers report 10 to 15 pct gains in February bar shipments. Expect equal rise next month to set new high in tonnage. And the advance is across the board—both hot-rolled and cold-finished; in carbon, alloy, stainless and tool steels.

DIECASTERS SEE BOOM BUSINESS IN '55 — P. 82 Job shop diecasters expect to top \$400 million this year after a dip to \$268 million in '54. Recession, defense stretchouts cut last year's sales volume 16 pct. Biggest boomers are '55 auto models, which use eight times as much zinc in front ends as '54 cars used. Aluminum use to rise with automatic transmissions, greater appliance use. Industry issues standards as aid for customers.

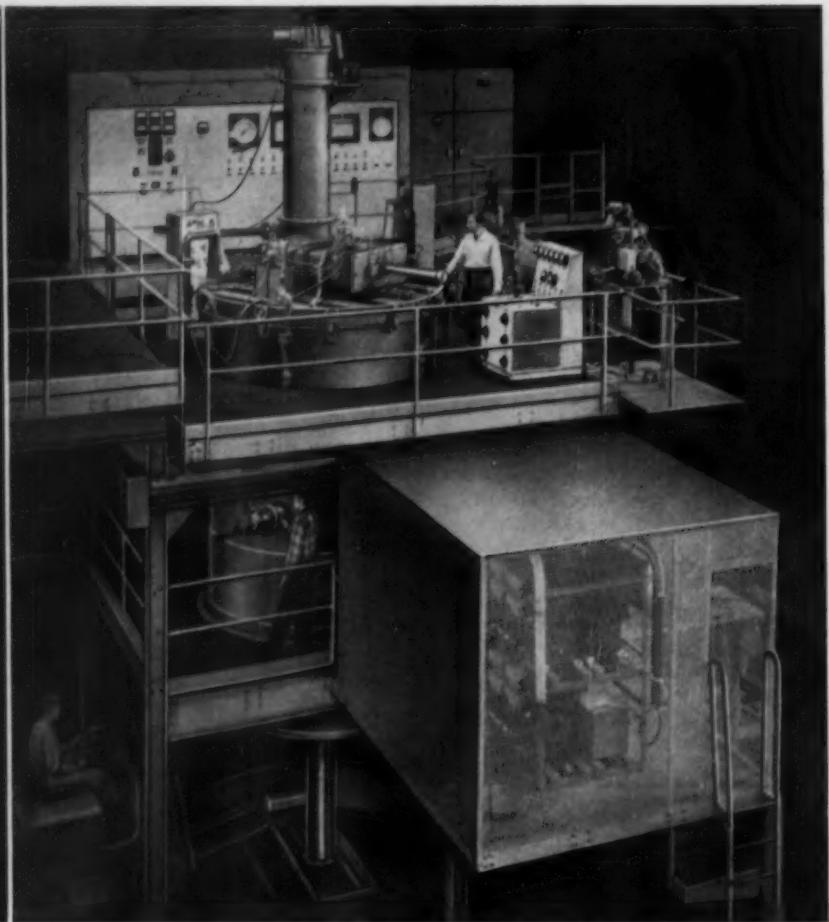
STEEL DEMAND PACE STRETCHES DELIVERIES — P. 187 Steel producers are finding it increasingly difficult to live up to delivery promises. Pressure is building up on all sides and the peak is nowhere in sight. Demand has reached the point where mill production and processing efficiency is at a premium. Some plants already are behind on delivery promises. As demand picture broadens, situation likely to worsen.

CARBON, ALLOY BARS JOIN MARKET UPSURGE — P. 188 Bars are no longer shrinking violet in steel recovery. February bookings rose 10-15 pct above January. Producers are talking about record March production. Hot-rolled, alloy, stainless and tool steel bars are sharing demand from warehouses, automotive, appliances.

GOVERNMENT RELEASES 8000 TONS OF COPPER — P. 194 Hard-pressed copper consumers are getting 8000 tons of the red metal from government inventory. Not strategic stockpile metal, it was bought under the Defense Production Act. ODM says it will not release stockpile-destined shipments.

SURVEY DETAILS FOUNDRY OUTLOOK FOR '55 Is the foundry business good, bad, or indifferent? How do production and sales now compare with conditions last year? What's the outlook for 1955? These and other questions on the foundry market are answered in another nationwide IRON AGE survey of iron, steel, and alloy foundries.

*what
made
vacuum
melting
work?*



*The first 1000-lb. vacuum furnace to be put into production.
Photo courtesy Universal-Cyclops Steel Corp., Bridgeville, Pa.*

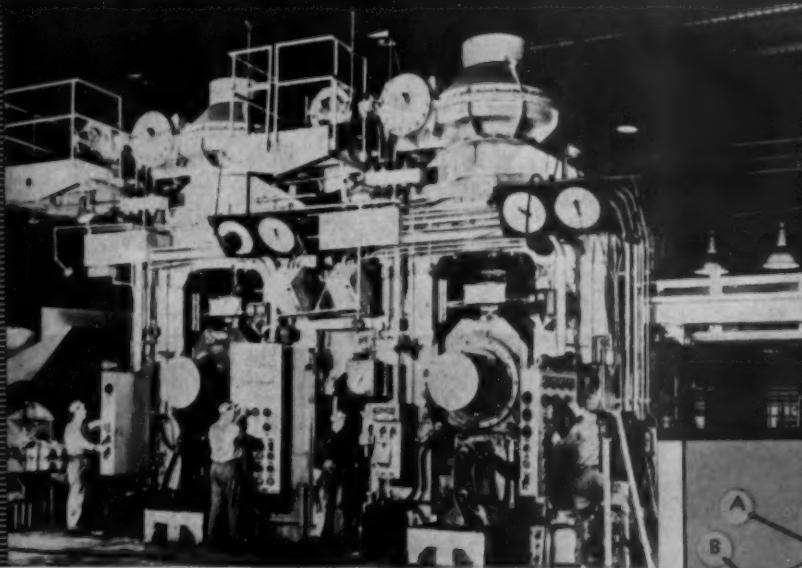
primarily—newly discovered vacuum techniques applied to forty years of induction furnace manufacturing experience. And only at Ajax does this experience cover so many melting developments over such a long period of time. Successful vacuum melting, as it comes from Ajax today, is just

another refinement in Ajax quality melting at production speed.

The vacuum furnace illustrated above is typical of a number which are now being built for purer, stronger alloys in capacities from 5 to 2000 lbs. For details, write Ajax Electrothermic Corp., Trenton 5, New Jersey.

Associated Companies: Ajax Electric Company—Ajax Electric Furnace Co.—Ajax Engineering Corp.





THE MORGOL FLINGER

is the answer on dry mills
where oil leakage is taboo

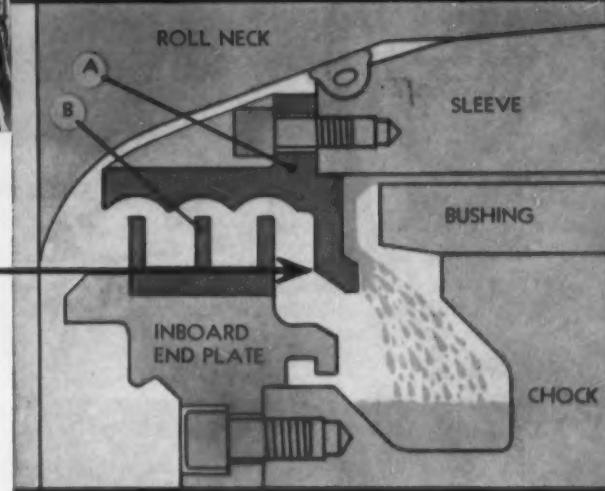
A

The rotating sleeve extension and flinger "A" throws oil from the bearing directly into the drain sump.

B

Any oil that might sneak by is caught in the grooved ring "B" and also returned to the sump.

Rubbing oil seals are completely eliminated.



The high speed tandem tin-temper mill of Jones & Laughlin, Aliquippa, Pennsylvania, illustrated, is one of the many dry mills enjoying this feature. This proven development is only one advantage of the modern Morgoil Bearing — the roll neck bearing that gives you the best performance at the lowest cost.

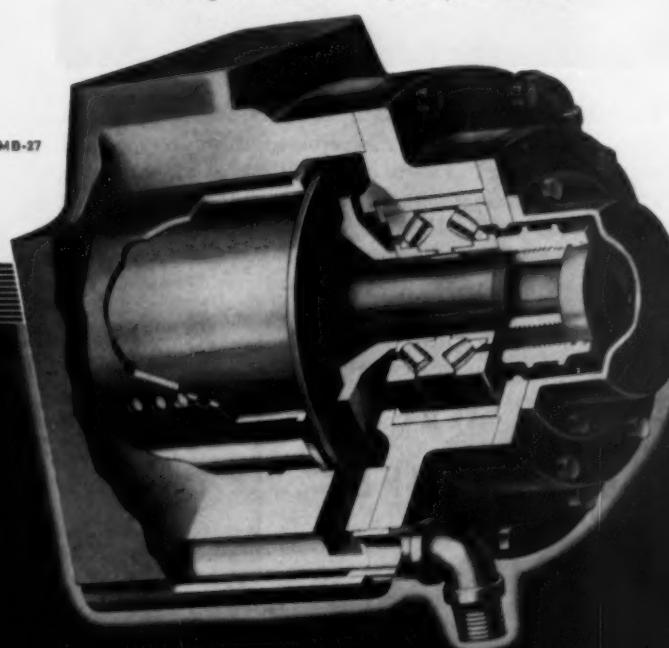
MORGAN CONSTRUCTION CO.

WORCESTER, MASSACHUSETTS

ROLLING MILLS MORGOL BEARINGS GAS PRODUCERS
WIRE MILLS EJECTORS REGENERATIVE FURNACE CONTROL

English Rep., International Construction Co., 56 Kingsway, London W. C. 2, Eng.

MB-27



MORGOL
ROLL NECK BEARINGS

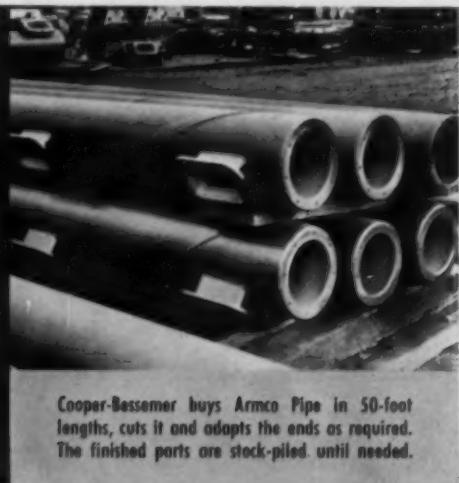
They Do Special Jobs with Standard Armco Pipe

Where product design requires a cylinder of uniform strength and roundness, many of the nation's leading manufacturers find the convenient, economical answer in Armco Welded Steel Pipe.

Perhaps there is a place in *your* plant or production line where Armco Pipe will help make your product better and production more efficient. The wide range of diameters, gages and lengths of Armco Pipe makes it easy to meet your exact needs. Here is how three prominent manufacturers are using this versatile pipe.



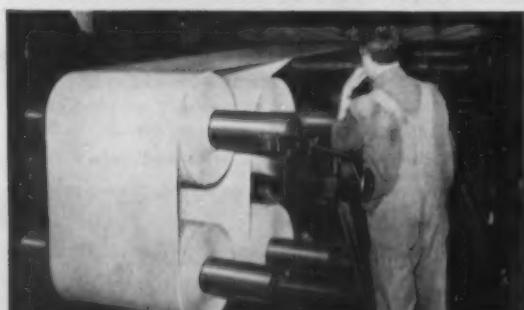
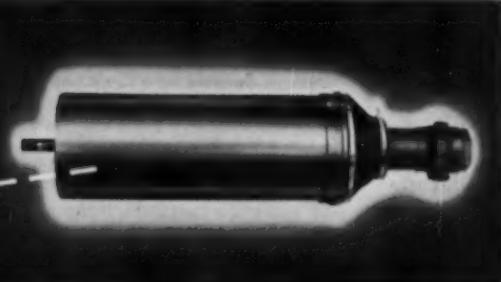
Armco Steel Pipe serves as the air inlet manifold on heavy-duty compressor units made by The Cooper-Bessemer Corporation, Mount Vernon, Ohio. This is a view of the Cooper-Bessemer Type GMVA-6, 800 hp gas engine, showing the air inlet manifold under the service platform. Pipe diameter is 14 inches.



Cooper-Bessemer buys Armco Pipe in 50-foot lengths, cuts it and adapts the ends as required. The finished parts are stock-piled until needed.



International Harvester Company, Chicago, uses two-foot lengths of small diameter Armco Steel Pipe to make the track spring housing on their model TD-24 Tractor.



In Watervliet, Michigan, the Watervliet Paper Company uses Armco Welded Steel Pipe to good advantage as paper cores. They buy 8-inch diameter pipe with a wall thickness of .141-inch, and adapt the ends to fit their equipment. Here, rolls of paper on Armco Pipe cores are being fed into a cutting machine.

Write us for more information about Armco Welded Steel Pipe. If you have a specific production problem involving a cylindrical structural shape, tell us about it. We'll be glad to help you determine the best answer with Armco Welded Steel Pipe. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 4585 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

**ARMCO WELDED
STEEL PIPE**



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and the Engineering Index.



Editorial:

Bare Knuckle Trade Talk

• WE HAVE NOT heard the last of talk about trading with the Communists. But if we are to talk and argue about it at all let's do it honestly.

A lot of hogwash goes around from time to time to the effect that trading with the enemy will bring peace. That is nothing but wishful thinking. It has no basis in fact.

Quite often people in this country wistfully talk about trade with Russia as if it were something that will lead to a better world. Others go all out for the idea that trade with Russia is a must for our allies.

As a general rule neither one of these viewpoints gets at the real facts. Communists will trade with the free world only when they can get something they want and need. In most cases it is something that may be used against us later as a war material, or else it is something that releases manpower for production of war goods.

If we trade with the Russians we must be sure that for anything we give them we get back something that is just as strategic in man-hours or material. But there is the rub. Experience shows that Russian export and import promises serve propaganda better than trade.

Trading with Red China would be—as far as the United States is concerned—dangerously stupid. But even though we feel this way let's face it: some of our allies think quite differently—and for what are good reasons as far as they are concerned.

When next you think about trade with our allies you must think about trade with the Reds. Our current free world friends must have someone to trade with. If we don't step up our trade with Britain, France, Japan and other countries they are going to trade with the Reds on a bigger scale sooner or later.

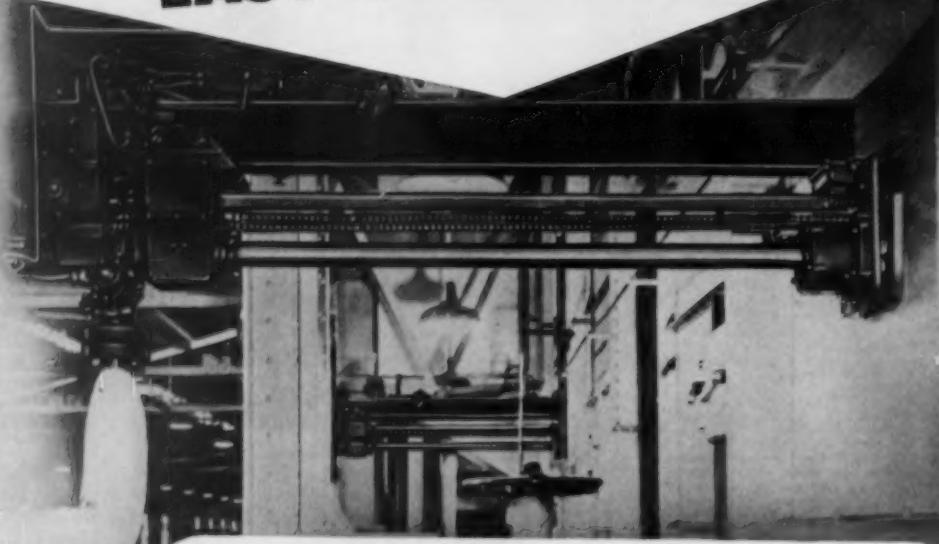
Before you ask them not to do this remember that for them, exports are often the difference between collapse and existence. That's the way they think and we can't change them. When our leaders talk about trading with the Reds let's be honest.

The United States must either do more trading with its allies or be prepared to see them do more strategic trading with the Reds and their satellites. This is the bare knuckle truth. We can't get away from it by using escapist words and phrases.

Tom Campbell
EDITOR



**LOW FRICTION
SELF-CLEANING
EASY MAINTENANCE**



**VULCAN BLOWERS RELY ON ATLAS
for longer trouble-free service**

As the jets move in and out on Vulcan Long Retractable Soot Blowers, manufactured by Copes - Vulcan Division, Continental Foundry & Machine Co., they depend on Atlas Roller Chain to supply the positive drive that needs little lubrication, is self-cleaning and is easily maintained.

Wherever a positive drive is required—low or high speed—there's an Atlas Roller Chain and "precision-matched sprocket" for low maintenance performance. Atlas Chain is toughened for extra wear by an exclusive heat treating process which builds greater strength and wear resistance into every pin, roller and link. It is pre-tested by a series of torture-tests that assure outstanding service on grueling drives or rugged shock loads.

For full rated speeds on your machine, longer wear, lower maintenance get the roller chain with the service "extras" . . . pre-tested more than 30 times for longer trouble-free service. Get Atlas Roller Chain and Sprockets . . . write for the Atlas Catalog and Handbook.

**ATLAS CHAIN & MANUFACTURING COMPANY
DOYLESTOWN, PENNA.**

ATLAS
ROLLER CHAIN
AND SPROCKETS

dear editor:

letters from readers

Helpful Hints

Sir:

Just a word of appreciation for the splendid editorials in the indispensable IRON AGE.

The "Helpful Hints for Executives" on Jan. 20 was especially good. *Horace Frommelt, Sales Manager, U. S. Engineering & Mfg. Co., Chicago.*

Steel in Cold Weather

Sir:

The experience of farmers in the province of Saskatchewan has not suggested that there are any severe problems of feeling cold weather there. Temperatures reach -50° in the area of Saskatoon and physiologically, at least, windchill may be very impressive.

The only supporting suggestion offered by a man who had lived thirty years in that province, when he read the article, was that if steel parts had to be pounded to be put together that they might break in cold weather.

Equipment involved used to include metal parts of horses' harnesses and logging chains used with a team of horses to give a hard pull. Tractors may now be substituted. Railroad rails, rolling stocks, bridges, street railway equipment and automobiles operate in this weather. I notice in the article reference to a special steel used by Canadian railroads in their colder regions and I am not sure whether they would classify Saskatchewan as colder.

This leads to the serious questioning of the possibility that our native steel may be "acclimatized." Perhaps due to minor differences in impurities which are normally of no significance steel from our sources is different in cold weather characteristics. If this proves so, a ready-made source of suitable material is available. *M. Conklin,*

Asst. Editor, Canadian Machinery & Manufacturing News, Toronto, Canada.

Hob Sharpener

Sir:

In the Feb. 10 issue of your magazine on the page entitled Newsfront, there is a paragraph concerning a hob sharpener reported to sharpen hobs up to twice as fast as conventional gear driven equipment.

We are very much interested in obtaining more explicit information on this machine, therefore, would appreciate your advising us the name of the manufacturer. *R. H. Brown, Budget Control Dept., Dana Corp., Toledo.*

Further information on the hob sharpener may be obtained from Star Cutter Co., 34500 Grand River, Farmington, Mich.—Ed.

Crane Scale

Sir:

May we have your permission to reprint as is the article "Crane Scale Simplifies Warehouse Weighing Operation" from your Jan. 27 issue?

We need to produce this material quickly for a current sales promotion campaign which is already underway. *E. G. Murphy, Market Development Mgr., Automatic Temperature Control Co., Philadelphia.*

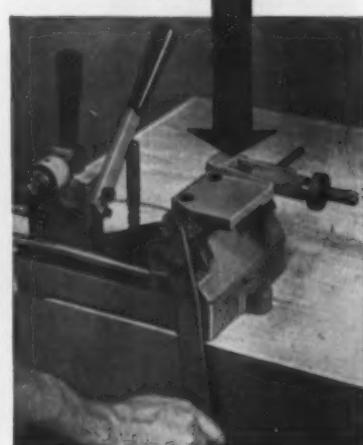
Steel Paint System

Sir:

Please send us more information concerning the paragraph "Now you can specify paint systems for steel" from the IRON AGE Newsfront, p. 49, Feb. 17 issue. *Sydney Gamlen, Metallurgical Laboratory, Engineering Div., Engineering, Construction & Maintenance, Eastman Kodak Co., Rochester, N. Y.*

Details on paint systems for steel may be obtained from Mellon Institute, 4400 Fifth Ave., Pittsburgh, Pa.—Ed.

make Springs
in Seconds!



Save Costly Special Orders
With the NEW

DI-ACRO* Spring Winder

This unique machine eliminates costly special spring orders, saves valuable waiting time. Winds flat, torsion, compression and extension springs to $1\frac{1}{2}$ " O.D. Handles round, flat and rectangular wire to $\frac{3}{4}$ " dimension. Note exclusive features in the hand operated Di-Acro Spring Winder which assure accurate tension and fast operation without special experience or skill.

new

TENSION CONTROL—Simply adjust to desired tension—the control keeps it uniform, for winding one spring or hundreds, and releases when each spring is wound.

new

WIRE CUT-OFF—After spring is wound, release tension and use cut-off lever to quickly cut end of spring to desired length.

new

CAM LOCK—Simply feed wire under cam, turn handle and wire is securely locked to arbor while spring is wound. No threading required.

FREE ENGINEERING SERVICE



Send us your spring forming problems—samples or dimension sketches—together with sufficient test material, and let us wind some sample springs for you free of charge. No obligation.

32-Page Catalog gives complete details on all Di-Acro Precision Machines.

See Di-Acro Exhibit Booth 718, Western Metal Congress, Los Angeles, March 28-April 1.

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PRECISION
METALWORKING
MACHINES



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G.M.-Specified

COMPASS CORD Transmission Belting

- A. Cord-covering envelope of tough, elastic fabric, resists wear.
- B. Multi-strand cords laid in a single plane carry the load. Cords on opposite sides of belt axis are twisted in opposite directions to insure true running.
- C. Thinner cross-section permits longer life over smaller pulleys.

1200% more life *from wire-winding belts*

ONCE steel wire is drawn, it must be wound on spools. This is done on special machines with the help of short, endless belts.

Previously used belts lasted only six weeks. Excessive oil, severe abrasion, short centers and high speed were the reasons for such short life. The G.T.M.—Goodyear Technical Man—was consulted. He suggested COMPASS CORD Transmission Belts (see blueprint) with oil-resistant top covers.

RESULT: These endless cord belts *cost less than half of those formerly used—last an average of 18*

months—cut down-time and maintenance costs inestimably.

How can the G.T.M. and COMPASS CORD Transmission Belts cut your drive costs? Find out by contacting him, your Goodyear Distributor or writing Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR can quickly supply you with *Hose, Flat Belts, V-Belts, Packing or Rolls*. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."

COMPASS CORD TRANSMISSION BELTS by

GOOD **YEAR**
THE GREATEST NAME IN RUBBER

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

fatigue cracks

by William M. Coffey

Your TV Reviewer

On the night of Feb. 23 history was made on Broadway. Post & Post, a fresh, sparkling new mother and daughter team lifted a tired old script on TV's "Sky Is The Limit" show to smash heights. Startled, tired old studio goers couldn't restrain themselves. This was *real theatre*. The show was stopped time and time again when a Mr. Charles Post rose to his feet with cries of "huzza," "superb," "huzza," "superb." Our tired old television eyes have not seen such a spontaneous tribute since Ann Corio blazed across the tired old tube in *Jungle Girl*.

The show itself was a contest of skill between Post & Post and a rival father & son team, Merrill and Merrill. Post & Post won by the overwhelming score of 525 to 450—and if they keep winning for four successive shows they get a free trip to Spain.

Incidentally Post & Post are the wife and daughter, respectively, of the Mr. Charles Post mentioned above who is a well-known figure around *THE IRON AGE*, your own *ffj*. Or perhaps we should say he was a well-known figure around *THE IRON AGE*. Because when Mrs. Post was asked "what does your husband do?" she only replied "publishing business." For weeks the rehearsal called for Mrs. Post to say "he works for *THE IRON AGE* which is the world's foremost metalworking weekly, has 177,500 readers, is the only metalworking weekly to be granted fast newspaper delivery by the Post Office and this year celebrates its 100th Anniversary which makes it the oldest business industrial magazine in America." You'll like Spain, Charlie. Commutation is much cheaper.

Dotten or Dutton?

While we're on the subject of families we herewith print this

plea from Mr. William L. Dutton, Box #331, Noroton, Conn.

Dear Sir or Madam:

Would you be good enough to look into any large alphabetized list of surnames that may be available to you, for the very rare surname of DOTTEN (not Dutton)?

If you should find one or more, it is a 97% certainty that the person is a blood relative of mine and I would like to contact him or her and have them meet the rest of the DOTTEN family (not Dutton).

For the past 32 years I have been recording the vital statistics of my ancestor James DOTTEN (not Dutton) and have over 3000 of them recorded to date. If you find a DOTTEN (not Dutton) would you give him the opportunity to write to me.

This is a brave man. We'd be a little afraid to try this with Coffey. Probably be like the Duttons.

New Puzzler

A jeweler repairs a man's watch and in taking it apart he accidentally loses the hour hand and the minute hand. So in reassembling the watch, he takes two extra hands from a large box of assorted spares available, but happens to pick up an hour hand that will fit only on the minute peg of the watch, and a minute hand that fits only on the hour peg of the watch. He, thus, inadvertently assembles the hands on the wrong pivots, winds the watch and sets it to show the correct time, 2 o'clock.

Of course, in operation, the hour hand, now pointing at 2, makes a complete revolution around to 2 again in one hour, while the minute hand, now pointing at 12, moves over only five-minute spaces in one hour.

Problem: At what time between 5 and 6 o'clock does the watch show the correct time anyway?

what you should know about

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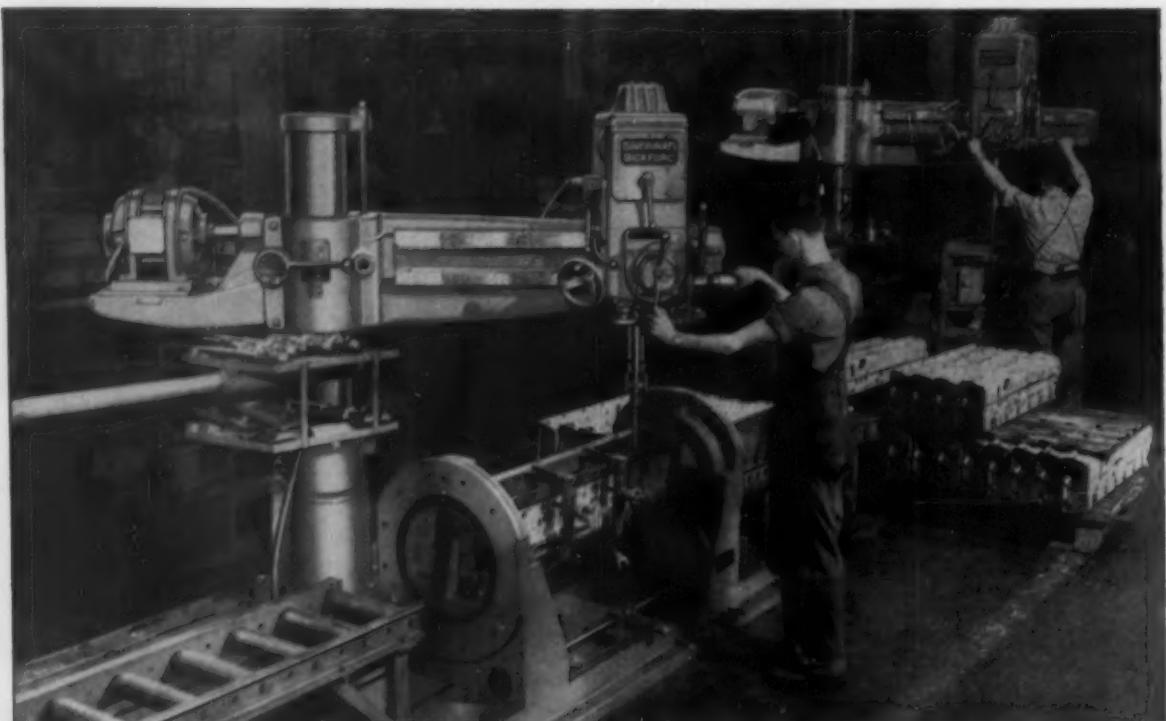
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**3 years of operation
with NO MAJOR
MAINTENANCE...**



Photos courtesy Caterpillar Tractor Co., Peoria, Illinois.



Camshaft Housings for new Caterpillar DW21 Wheel-type Tractor illustrated in insert picture, showing casting before and after drilling operations.

The performance of Cincinnati Bickford Super Service Radial Drills at Caterpillar Tractor Co. has been outstanding, steady and trouble free.

On this job, including drilling, tapping and reaming, 116 holes are produced, 14 are reamed within .0005" tolerance. Caterpillar Tractor Co. also states Cincinnati Bickford Super Service Radial Drills have contributed to the advancement of their product.

Write for Catalog R-21-C.



RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

dates to remember

MARCH

PORCELAIN ENAMEL INSTITUTE—Pacific Coast conference, Mar. 10-11, Biltmore Hotel, Los Angeles. Institute headquarters are at Dupont Circle Bldg., 1346 Connecticut Ave., N. W., Washington, D. C.

STEEL FOUNDERS' SOCIETY OF AMERICA—Annual meeting, Mar. 14-15, Drake Hotel, Chicago. Society headquarters are at 920 Midland Bldg., Cleveland.

AMERICAN SOCIETY OF TOOL ENGINEERS—Annual meeting, Mar. 14-15, Shrine Auditorium and Exposition Hall, Los Angeles. Society headquarters are at 10700 Puritan Ave., Detroit.

EXPOSITIONS

NATIONAL ASSN. OF CORROSION ENGINEERS—Annual meeting and Show, Mar. 7-11, Palmer House, Chicago. Association headquarters are at 1061 M & M Bldg., Houston.

AMERICAN SOCIETY FOR METALS—Western Metal Exposition and Congress, Mar. 28-Apr. 1, Pan Pacific Auditorium, Los Angeles. Society headquarters are at 7201 Euclid Ave., Cleveland.

NATIONAL MACHINE TOOL BUILDERS' ASSN.—Machine Tool Show, Sept. 6-17, International Amphitheatre, Chicago. Association headquarters are at 2071 E. 102nd St., Cleveland.

NATIONAL ASSN. OF WASTE MATERIAL DEALERS, INC.—Annual convention, Mar. 20-22, The Conrad Hilton Hotel, Chicago. Association headquarters are at 271 Madison Ave., New York.

INTERNATIONAL ACETYLENE ASSN.—Annual spring convention, Mar. 22-24, Shamrock Hotel, Houston. Association headquarters are at 30 E. 42nd St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Annual conference, Mar. 23-24, Hotel Statler, Cleveland. Society headquarters are at 29 W. 39th St., New York.

AMERICAN MACHINE TOOL DISTRIBUTORS ASSN.—Spring meeting, Mar. 25-26, The Greenbrier, White Sulphur Springs, West Va. Association headquarters are at 1900 Arch St., Philadelphia.

STEEL SHIPPING CONTAINER INSTITUTE, INC.—Annual meeting, Mar. 29-31, Biltmore Hotel, Palm Beach, Fla. Institute headquarters are at 600 Fifth Ave., New York.

APRIL

NATIONAL FLUID POWER ASSN.—Annual spring meeting, Apr. 4-6, The Broadmoor Hotel, Colorado Springs, Colo. Association headquarters are at 1618 Orrington Ave., Evanston, Ill.

AMERICAN HARDWARE MANUFACTURERS ASSN.—Spring meeting, Apr. 10-14, Palm Beach, Fla. Association headquarters are at 342 Madison Ave., New York.

WIRE REINFORCEMENT INSTITUTE, INC.—Spring meeting, Apr. 11, The Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at National Press Bldg., Washington, D. C.

CONCRETE REINFORCING STEEL INSTITUTE—Annual meeting, Apr. 11-16, The Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at 38 S. Dearborn St., Chicago.

AMERICAN SOCIETY OF LUBRICATION ENGINEERS—Annual meeting and exhibit, Apr. 13-15, Sherman Hotel, Chicago. Society headquarters are at 84 E. Randolph St., Chicago.

FIRE!



PUT IT OUT IN SECONDS
with a Kidde Portable extinguisher

Unless you get the jump on fire the minute it starts, you stand a good chance of kissing your business good-bye.

That's why it's so important to have a Kidde portable extinguisher near *every* fire hazard in your plant.

Protect motors, electrical equipment, flammable liquids and machinery with Kidde portables. Then, when fire strikes, you're ready for it.

Just grab a Kidde CO₂ or dry chemical portable, aim the horn, pull the trigger, and—Whoosh! No more fire!

Your *next* fire could be your *last*... Contact Kidde today!



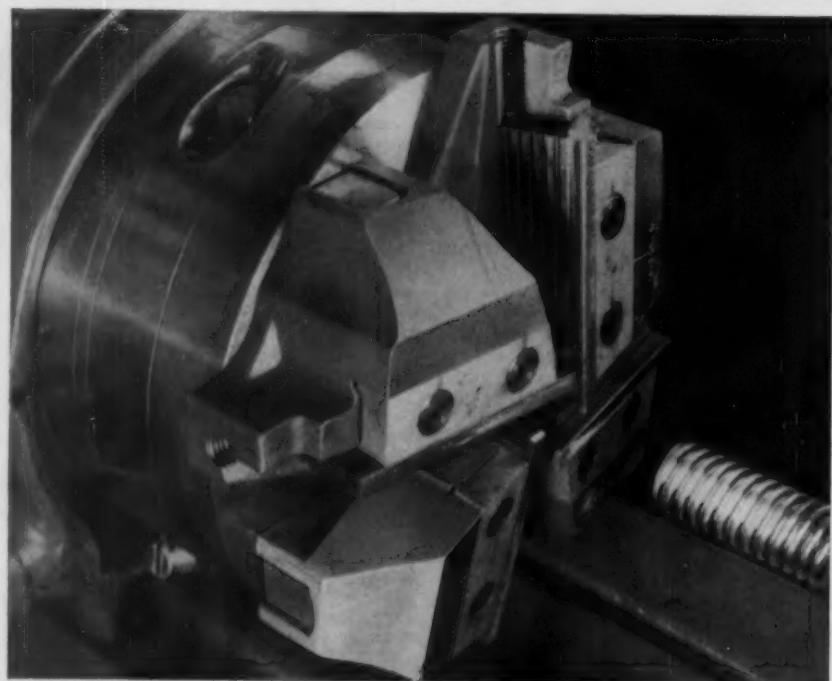
The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

Kidde

Walter Kidde & Company, Inc.
349 Main St., Belleville 9, N. J.

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This Could Be



347 stainless steel—1 1/8" Acme threads 15 1/8" long

420-C

Your Threading Job!

If it were, your LANDMACO Threading Machine would be threading valve stems in $2\frac{1}{2}$ minutes that formerly required nearly $3\frac{1}{2}$ hours. Thread finish and concentricity would be improved. In addition, you could produce many other sizes and types of threads *on this same machine.*

This is one example of the daily performance of LANDIS Equipment in thousands of plants throughout the world. Nearly 350 Threading Machines and Threading Tools comprising the Landis Line will produce all types of internal or external, straight or tapered threads through Cutting—Grinding—Tapping—or Rolling.

While this may not be your Threading Job, LANDIS Threading Equipment can do an outstanding thread production job in your plant. Send us your specifications, and let us suggest the Threading Equipment best suited to your need. Our Engineering Department will design any special equipment, fixtures, or methods required by unusual operations.

THE WORLD'S LARGEST MANUFACTURERS OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING

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Now you can make WELDED TUBES

faster, better, at lower cost, from -

STEEL
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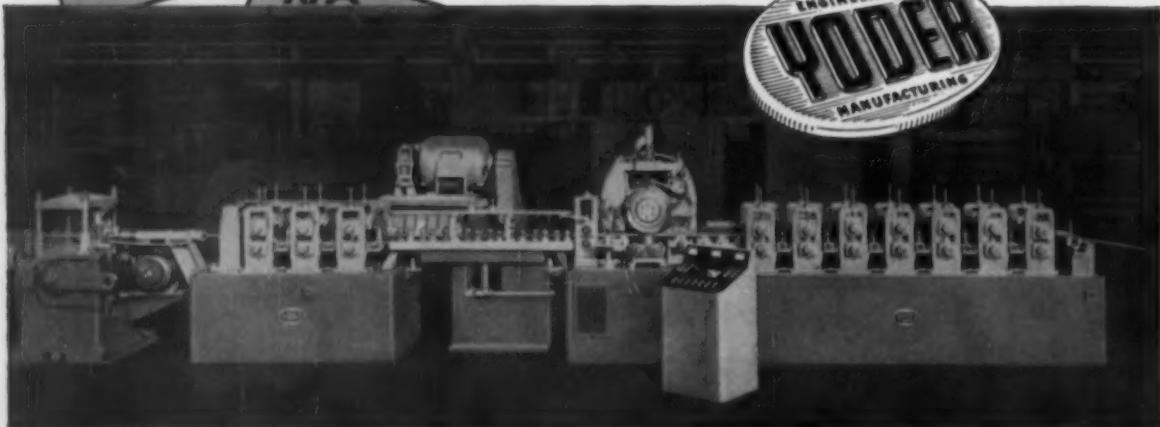
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Further, speeds up to 250 fpm are reached in induction-welding steel tubing in the same gauges.

New, compact Yoder "4-in-1" Welding Transformer is the last word in resistance-welding steel pipe and tubing in sizes up to 24" diameter.

More specific information, literature and estimates on request, without obligation on your part.

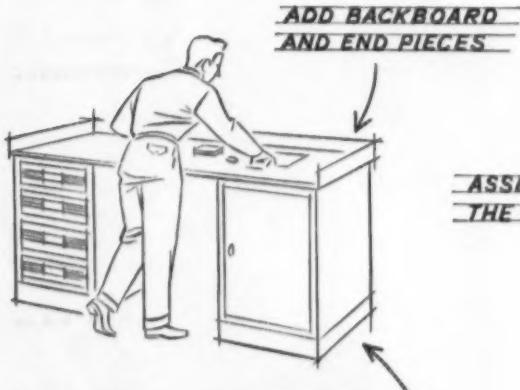
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HOW TO USE STANDARD HALLOWELL UNIT WORK BENCHES AND ACCESSORIES IN PLANT MODERNIZATION



**MODEL 640 - BENCH TOP, DRAWER UNIT,
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USE THEM AS INDIVIDUAL BENCHES

**4 TOP MATERIALS, 2 LENGTHS, 2 WIDTHS
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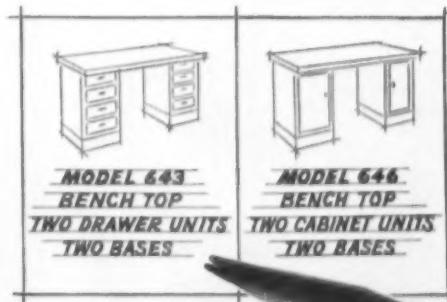


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TWO DRAWER UNITS
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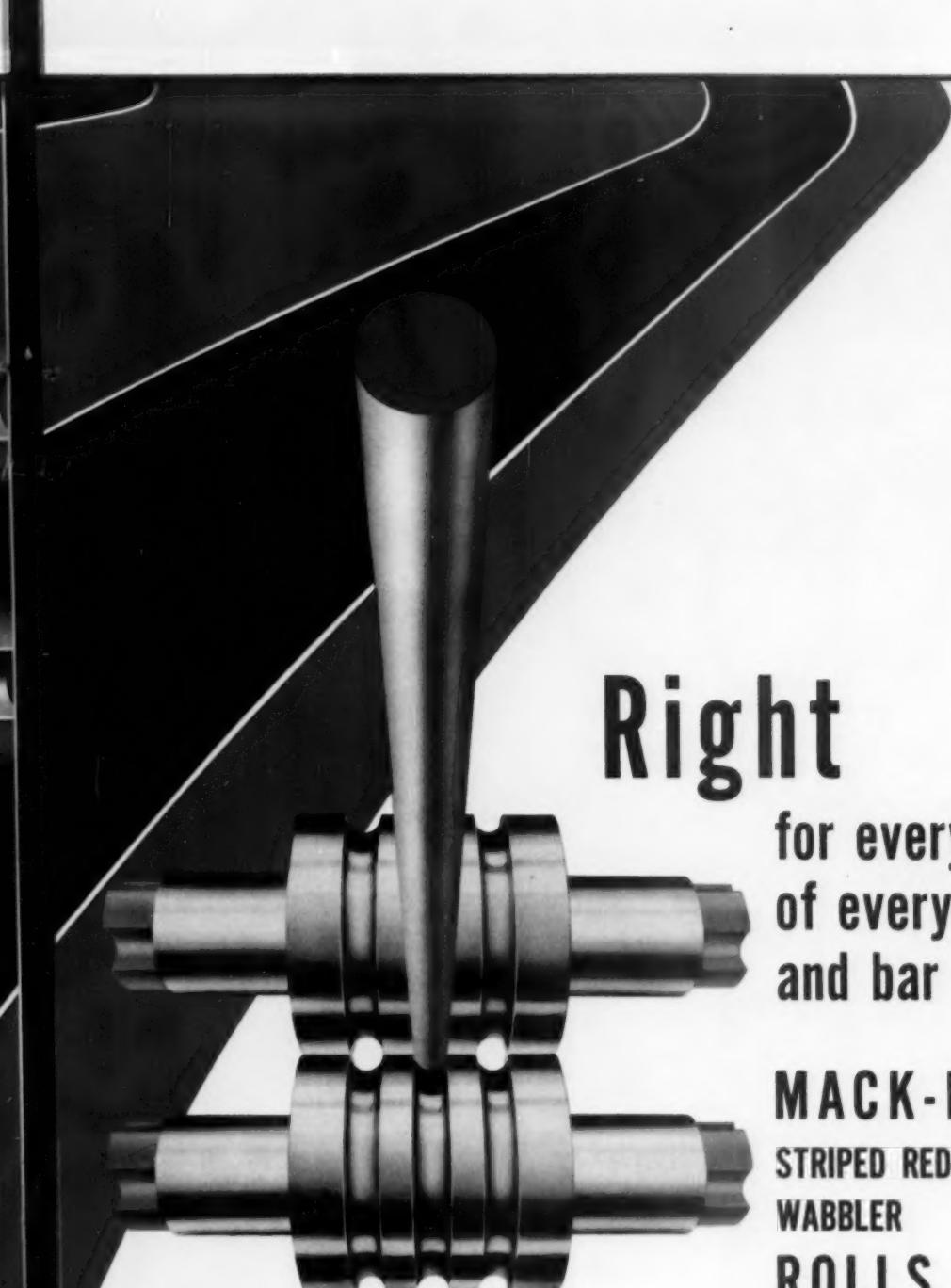
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Midland "Supermetal" Rolls—high carbon alloy rolls for maximum tonnage production in the intermediate stands where deep penetration of controlled roll hardness is essential to good finish.

Midland "Supermetal" Rolls—high carbon alloy rolls for square production in recycling stands of bar and billet mills, as well as for blooming and slabbing mills.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE all types of cast mill rolls, improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hempfill rotary straighteners . . . electronically controlled contouring lathes . . . screw feed roll turning lathes . . . heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills.



Right
for every stand
of every billet
and bar mill...

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STRIPED RED
WABBLER
ROLLS

M-H "Nironite C" Rolls—indefinite chilled nickel iron alloy—withstand wear as well as impart a high finish, assuring top performance in the finishing stands of continuous bar and billet mills.

**MACKINTOSH
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Makers of the rolls with the
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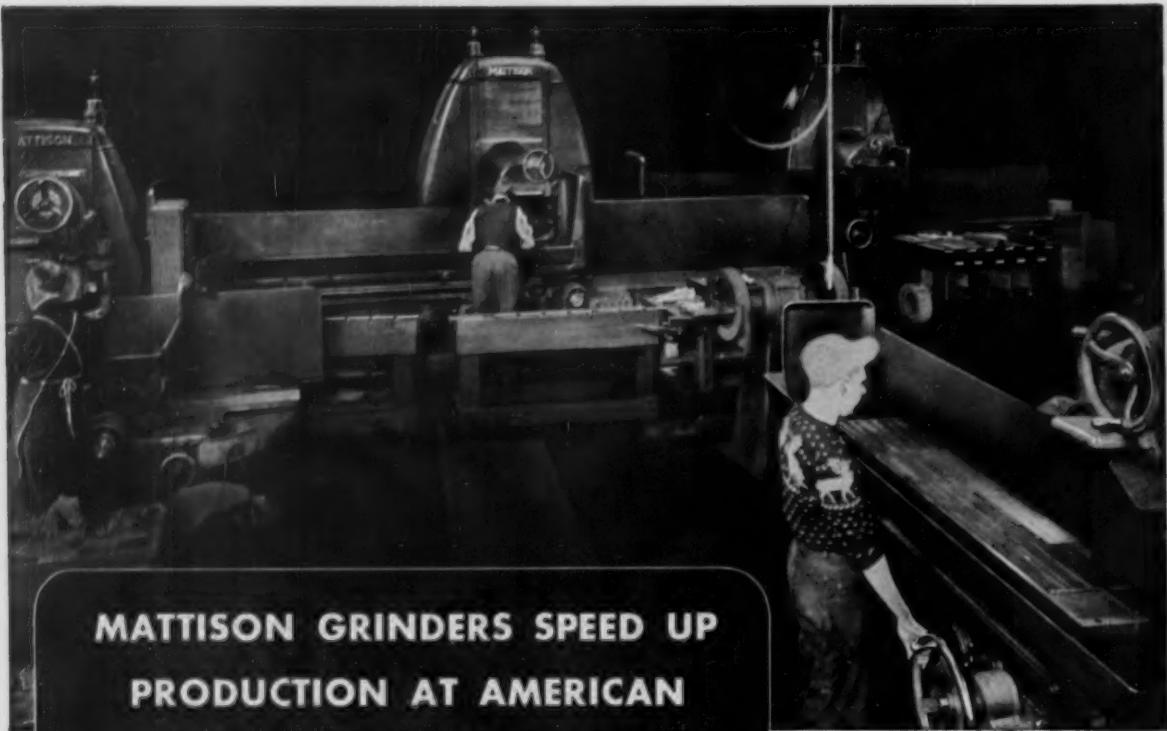
PITTSBURGH AND MIDLAND, PA.

High speed, high tonnage operation of Billet and Bar Mills, with its significant influence on production costs calls for extra discrimination in the selection of rolls.

Bar mill operators know that the solution of manufacturing cost and quality problems depends to a large degree on the rolls and the roll maker's ability to satisfy their exacting demands.

Many years of roll making experience combined with a policy of close cooperation with mill operators and roll designers equip Mack-Hemp to produce rolls that set a record production pace in today's efficient mills.

That's why so many steel producers will tell you that now, more than ever, it pays to keep an eye on what's new and different at Mack-Hemp.



**MATTISON GRINDERS SPEED UP
PRODUCTION AT AMERICAN
SAW & MFG. COMPANY**



● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

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ROCKFORD • ILLINOIS

ANOTHER EXAMPLE of
REDUCING COSTS WITH-

Buhr

ECONOMATION

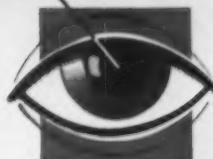
Drills, chamfers, spot-faces and individual-lead-screw taps 377 master-brake cylinders an hour gross....



and features electronic mechanism for checking broken drills!

This 7-way dial-type hydraulic-feed Buhr Special has a 48"-diameter 7-position power-operated index table, complete with shot bolt. Two parts are loaded per station in each of its seven fixtures. Automatic clamping of fixtures is performed by a power-wrench with torque control.

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Find out how **Buhr Economation** can reduce your production costs. Phone, wire or write us. A consultation with one of our top sales executives will be arranged promptly!

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MULTIPLE-SPINDLE
HIGH PRODUCTION MACHINERY

BUHR MACHINE TOOL CO. ©

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IT'S THE NEW, "YEARS-AHEAD" LINE ...

Far out front on every point of comparison



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Practically limitless in their scope of forming, bending, punching, blanking and related operations, Niagara Press Brakes get more done for you because they do more jobs. One reason: Advanced design. Another: The extensive line of Niagara Press Brake Dies available.

UNIFORM BENDS WITH STRAIGHT- EDGE ACCURACY

Double end twin drives with double reduction gearing, on *all models*, provide uniform, constant application of power at both ends of the ram. Off-center loading presents no problem.

Rugged, streamlined frames feature box type crowns of unequalled strength and rigidity, assuring maximum resistance to deflection and permanent alignment of bearings and ram.

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Close attention has been given to every design detail. Nothing has been overlooked. Each frame size has been scientifically tested to detect and eliminate harmful stresses at all critical points.

Laminated non-metallic ways, an exclusive Niagara feature, reduce wear to an absolute minimum, providing accurate alignment and longest possible service life. All gearing is totally enclosed in sealed oil baths for thorough, clean lubrication.

Once again, Niagara's forward-thinking engineering has produced a metal working machine years ahead of its time. As you become familiar with the significant developments embodied in this revolutionary new line of all steel press brakes, you will realize why it carries the Niagara nameplate. After all, who is more uniquely qualified to be its builder than the builder of America's most famed and most complete line of presses, shears, other machines and tools for plate and sheet metal work?

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...AT SAVINGS!**



MASS PRODUCTION OF STEEL PRODUCTS at Republic goes beyond fasteners. Take this steel building, for example, made by Republic's Truscon Steel Division. It is one of many standard styles and sizes produced by the world's largest manufacturer of metal building products. Truscon Steel Buildings offer the economies of standardization—plus fire protection, ease and speed of erection, low upkeep, high investment value. They're low in cost and can be disassembled and re-erected as space-needs change.



TIN PLATE IS ANOTHER EXAMPLE OF REPUBLIC'S DIVERSITY of operation. Electrolytic and coke tin plate for all types of cans—food, oil, paint, beverage, etc.—is made by the cold reduction process which gives all the qualities necessary for making tin containers on high-speed automatic machines. Black plate is also available in standard grades for such applications as lacquered cans and light stampings.



REPUBLIC IS ALSO A MAJOR PRODUCER OF HOT ROLLED BARS, a substantial portion of which are used in forgings, such as these. Forging stock is available in all commercial grades of carbon, alloy and stainless steels. Republic is prepared to supply standard hot rolled shapes as well as special sections.



Types

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This selection of fasteners represents only a small part of the more than 20,000 regular types and sizes made and stocked by Republic.

To meet the varied requirements of all types of industry, Republic operates the country's largest, most modern and diversified fastener plant under one roof. Daily capacity is 15,000,000 fasteners. This big-volume production includes everything from machine bolts, cap screws, hot and cold punched nuts to rivets, sheet metal screws, track bolts, alloy studs.

In addition, Republic produces over 8,000 special types and sizes of fasteners—like mine roof bolts,

REPUBLIC
World's Widest Range of Standard



and Sizes?

AND STOCKS OVER 20,000

"Nylok" nuts, high-strength bolts.

Republic takes no chances on quality. It's controlled at every stage of production—from raw materials to finished fastener. Republic uses its own ore, makes its own steel (over 50 analyses of carbon, alloy and stainless), employs the most modern machines and procedures.

If you are interested in quality, uniformity, delivery, dependability, ease of application and long service life—you will get them all in Republic Fasteners.

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STEEL

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March 3, 1955



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R-7754

Carbide grinding's



Norton Vitrified Bonded Diamond Wheels feature fast stock removal and high resistance to grooving. Long service life is another big advantage, since this Norton-developed bond holds each diamond tightly, for maximum useful cutting action. **Typical Applications:** production grinding of single-point carbide tools; grinding chip breakers; cylindrical, surface and internal precision grinding of carbide tools, cutters, discs, gages, rolls, etc.



Norton Resinoid Bonded Diamond Wheels are made in two bond types — regular, for wet grinding and B6, for dry grinding. Each type gives you extra fast cutting action and long, money-saving wheel life. **Typical Applications:** grinding multi-tooth cutters, where their size-holding ability assures uniform height to each cutter tooth; cutting-off damaged carbide tools for salvage; grinding threads "from the solid" in carbide taps and thread gages.



"CROWN JEWELS"

*Norton diamond wheels bring
unbeatable economy to your production*

You buy diamond wheels for carbide grinding as an investment in faster, better grinding performance and lower production costs.

You can be sure of peak profits from this investment when your choice is Norton diamond wheels. Backed by Norton's long leadership in development and manufacture — and by news-making "firsts" in diamond wheel progress — they're carbide grinding's recognized "Crown Jewels", with a royal reputation for the best in diamond wheel value!

"CROWN JEWEL" Highlights

NORTON: *was first to introduce resinoid, metal and vitrified bonded diamond wheels . . . does all its own sizing, grading and laboratory checking of diamonds . . . duplicates wheel specifications with constantly controlled accuracy, to assure you uniform top performance . . . brings you a complete line, covering*

every diamond wheel application in every field — carbide, stone, glass, ceramics, etc. . . . gives you fast service from full stocks in Worcester, five warehouses and Distributor's stocks.

Your Norton Distributor

is ready with quick deliveries of the diamond wheels you need for better, more economical carbide grinding. Ask him for the 142-page illustrated booklet, *Grinding Carbide Tools*, and the complete net priced Diamond Wheel Catalog or write for them direct. And remember: only Norton offers you such long experience in both grinding wheels and machines to help you produce more at lower cost. **NORTON COMPANY**, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

Making better products . . . to make your products better



Norton Metal Bonded Diamond Wheels are engineered by Norton for top savings on certain grinding jobs where great durability and resistance to grooving, rather than a fast rate of cut, are the chief requirements. *Typical Applications:* sharpening single-point carbide tools; reconditioning dull or chipped carbide tools; cutting-off sintered carbide blanks and a great variety of other materials — glass, porcelain, germanium, cermets and stone.

W-1014

NORTON

and Its BEHR-MANNING division

NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

HOW HYATTS CAN HELP YOU...



INCREASE STEEL PRODUCTION:

Maximum utilization of equipment is more important than ever these days—if you want to meet the demand for more production and still keep your costs in line. A single roller bearing failure that shuts down one machine can cripple a vital operation—bottleneck your whole production schedule—cost countless dollars that could so easily have been saved!

**Always specify
or replace
with ...**

That's why so many major steel mills standardize on Hyatt Roller Bearings in their rolling tables, lineshafts, cranes, motors, cars and similar vital applications. Down through the years, Hyatts have conclusively proved they *save power—extend equipment life—last longer with less maintenance*. In the long run, the best bearings you can buy are the most economical—HYATTS!



HYATT

STRAIGHT

BARREL

TAPER

ROLLER BEARINGS

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

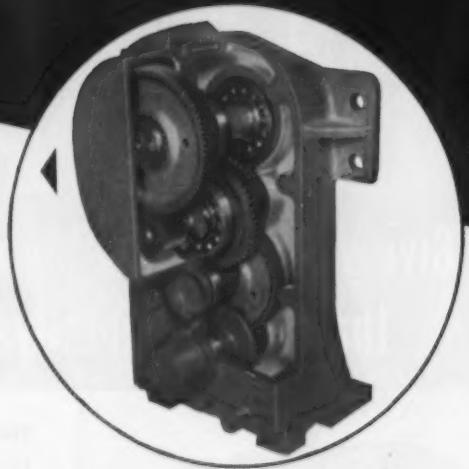
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MONOTRACTOR

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Automatic Handling



The NEW American MonoTractor will fit precisely into any overhead handling system for automatic transfer of materials.

This new unit offers these advantages:—

1. Duty-Rated Life Time Gearing.
2. Speed Range from 35 to 350 F. P. M.
3. Horsepower Range for $\frac{1}{4}$ to 2 H.P.
4. Any Standard NEMA Motor.
5. Any Type Motor Brake Can Be Applied.
6. Operates on Any Smooth Flat Flange Track.

This precision built tractor unit offers continuous trouble-free transfer of any type of carrier for power propulsion. American MonoRail engineers offer wide experience in the application of these units. Let them help you solve your automatic handling problems.



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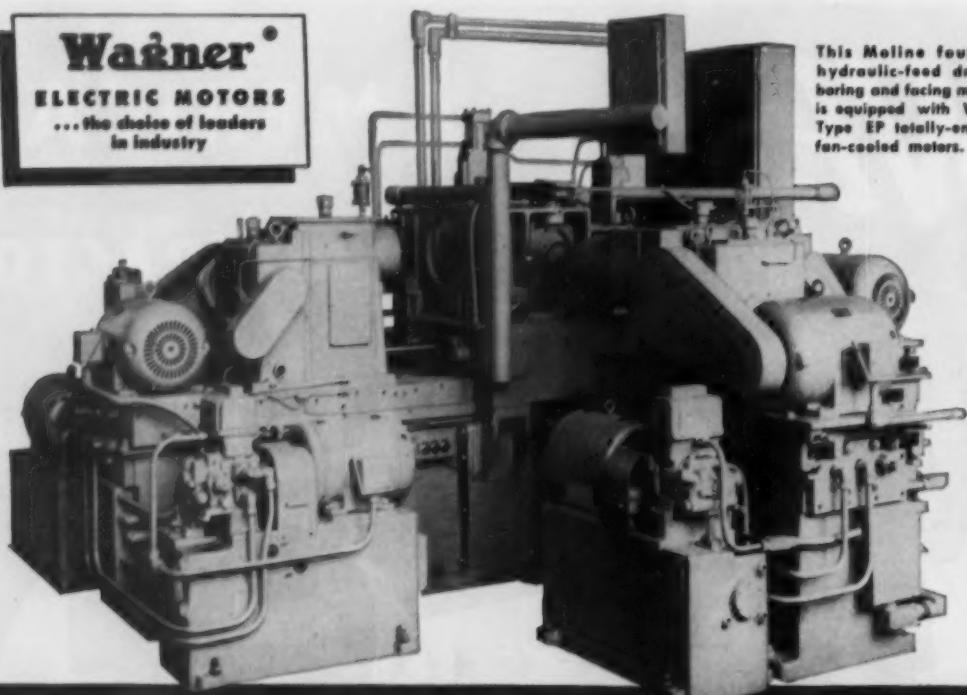
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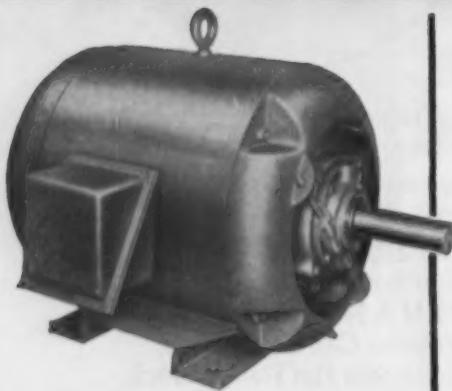
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This Moline four-way hydraulic-feed drilling, boring and facing machine is equipped with Wagner Type EP totally-enclosed fan-cooled motors.

Give your machine tools the **EXTRA ADVANTAGES**
that Wagner Totally-Enclosed Motors provide



Wagner totally-enclosed fan-cooled motors are available in either steel or cast iron frame construction; in standard or explosion-proof types; single speed or multi-speed; single-phase, 2 phase or 3 phase; in ratings to 250 horsepower.

THEY ASSURE LESS DOWN TIME. Wagner totally-enclosed fan-cooled motors are fully protected against damage from steel filings, chips, dust, dirt, fumes and moisture. This built-in protection assures freedom from excessive down time caused by motor failure.

THEY REDUCE MAINTENANCE COSTS. Wagner totally-enclosed motors require no maintenance other than periodic lubrication. These motors are designed to run cooler and longer between maintenance periods, but when greasing is necessary, readily accessible lubrication openings permit addition of grease or a complete relubrication.

Whatever your requirements may be, there is a Wagner Motor to fit every need. Bulletin MU-185 gives full information.

Your nearby Wagner engineer can help you select the right motors for your applications. Call the nearest of our 32 branch offices, or write us.



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ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE
BRAKE SYSTEMS—
AIR AND HYDRAULIC

African Elephant

LOXODONTA AFRICANUS



Strength

For sheer strength, practically no creature in the world of nature excels the African elephant.

This mammal can coil his trunk around a sizable tree and tear the tree from its roots. An adult elephant can carry a load weighing a ton or more on its back.

Large bull African elephants sometimes reach the height of eleven feet and weigh six to eight tons. To sustain this great weight elephants' limb bones are exceptionally thick, strong and straight. Each bone rests vertically on the bone beneath it.

For sheer strength, aluminum alloys are unique in the world of metals. Still retaining their characteristic of light weight, heat-treated aluminum alloys possess tensile strength ranging up to 80,000 pounds per square inch—well above that of many types of steel.

And in addition, aluminum is one of the most easily fabricated of all commercial metals.

Aluminium Limited Sales, Inc. is the distributor in the United States for aluminum from Canada. We will be glad to help you choose the best fabricating methods for making your products of aluminum.



Strength

Bridges, Towers, Custom Engineered Fabrication.
Many structures where steel has been considered the only suitable material are now being designed in aluminum. People like things made with aluminum.

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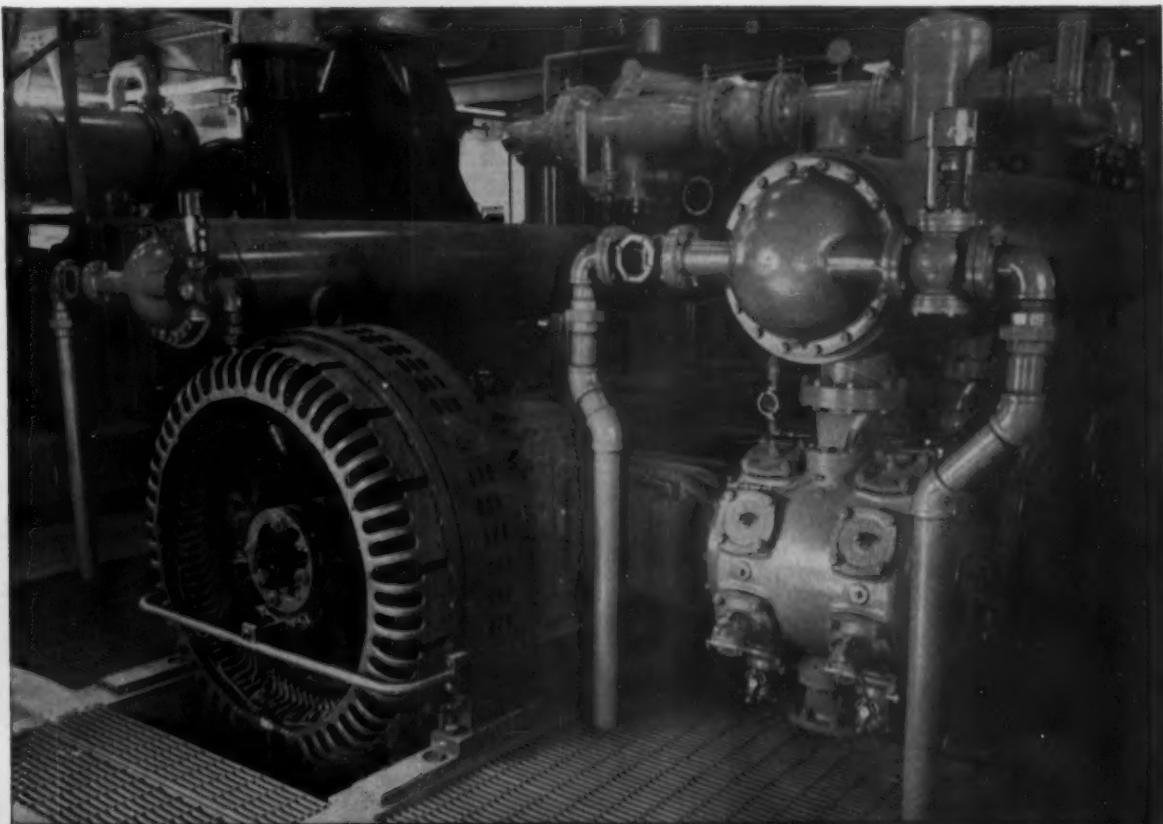
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CLARK BALANCED/OPPOSED COMPRESSOR

Used for testing jet components in Bendix Aviation's new research center

Speeds up to supersonic levels! Atmospheric conditions ranging from sea level to 80,000 feet! Temperatures from minus 100° F. to plus 800° F. These are the conditions at which Bendix Aviation Corporation's new research facility at Teterboro, N. J. can test component equipment for jet aircraft and missiles.

Destined to save thousands of man-hours of engineering research, the new facility utilizes the latest combinations of pneumatic and electrical equipment. Playing an important part is a Clark 600 horsepower CMA-6, Motor Driven, Balanced/Opposed Compressor which supplies air at 200 psi for test purposes.

Because of the nature of the operation, per-

fect balance and accurate match of supply to demand, through flexible compressor cylinder loading, were important considerations in the selection of a Clark unit. Compactness saved considerable floor area.

A complete Clark line of Balanced/Opposed Compressors in the 150 to 4500 horsepower range is available in various cylinder arrangements to meet practically any requirement. A Clark representative will gladly furnish complete details. Write for Bulletin 118.

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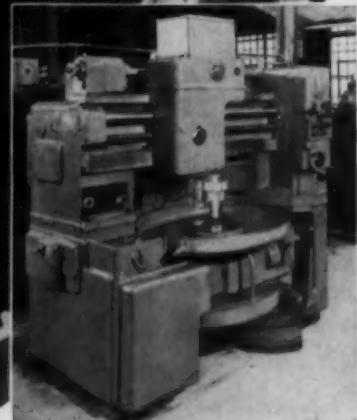
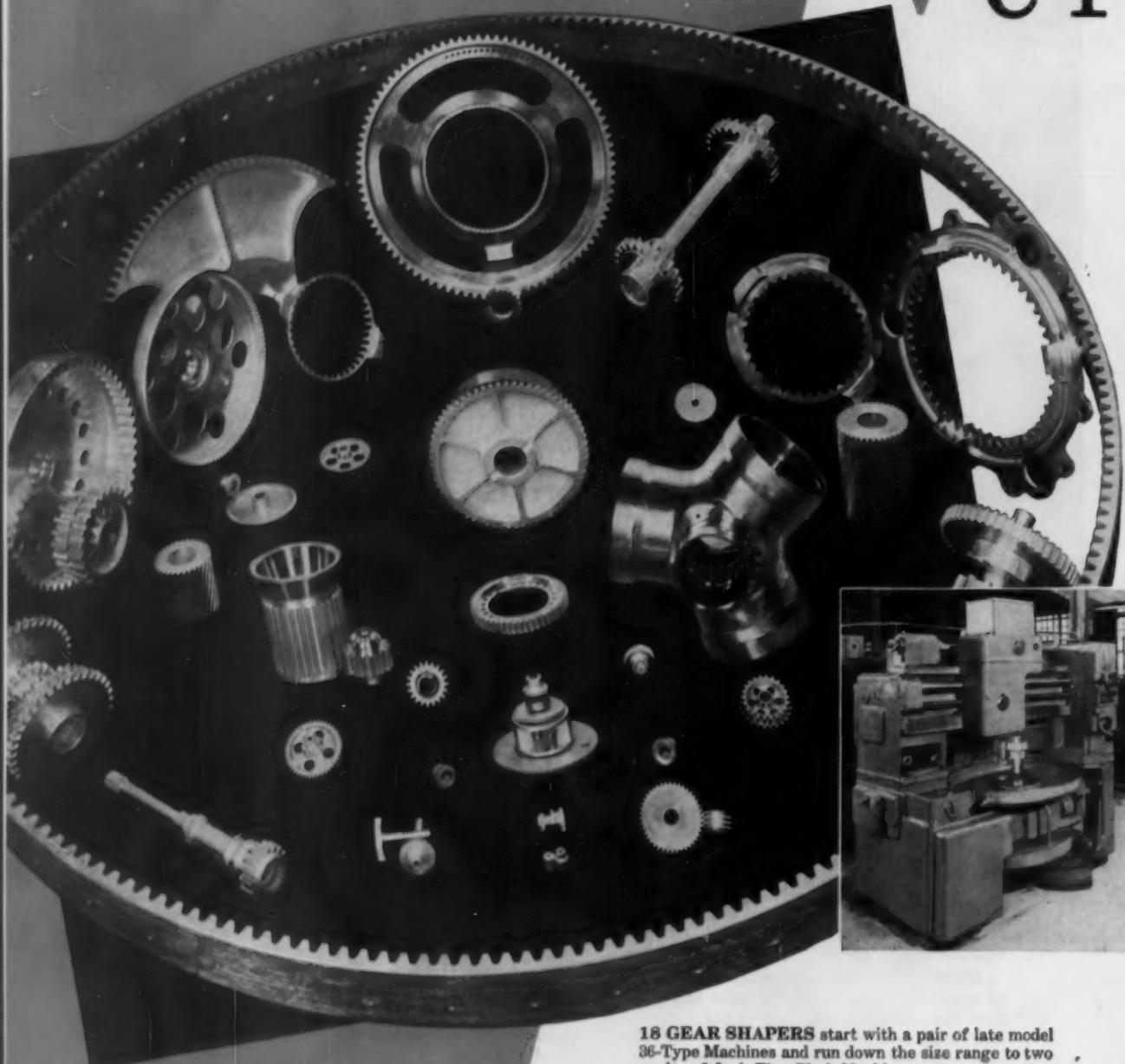
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compressors

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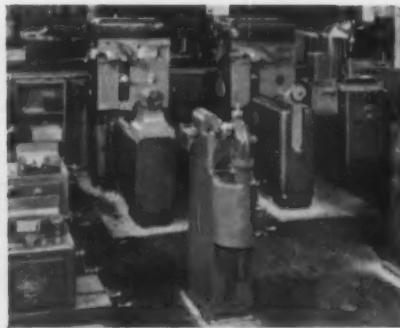
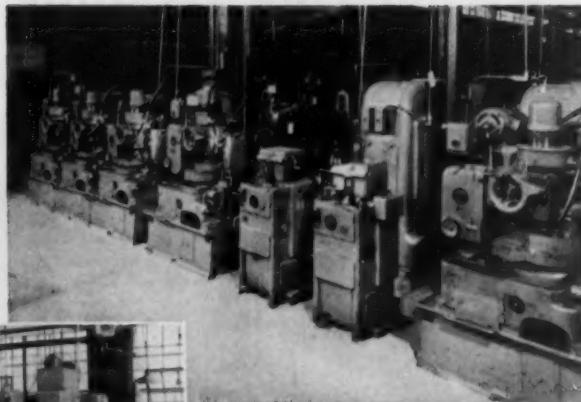


18 GEAR SHAPERS start with a pair of late model 36-Type Machines and run down the size range to two modern 3-Inch Fine-Pitch Machines

THE *Fellows*

s a t i l i t y

The Steel Products Engineering Co., Springfield, Ohio pins its faith to FELLOWS gear production equipment FOR ALL SIZE CLASSIFICATIONS



7 FELLOWS GEAR INSPECTION INSTRUMENTS include Red Liners and Involute Measuring Instruments

Equipped with Fellows Gear Shapers of different sizes ranging in capacity from 3" up to 36" along with Fellows Inspection Instruments for checking gear profiles, tooth accuracy, etc... this well organized precision shop can profitably handle jobs in *all* size classifications. They cut fine instrument gears of Aircraft Quality... small and large diameter internal gears... cams, ratchet teeth, interrupted profiles, segment gears, and many unusual contours possible only with the Fellows Method.

In addition to the versatility of Fellows Gear Shapers, another feature that pays off for Steel Products is the quick and easy change-over from one job to another on these machines... a very important cost factor when frequent job changes and both long and short runs are involved.

Our Sales Engineers can give you the facts about the value of Fellows equipment in your plant. Call our nearest office.

GEAR SHAPER COMPANY

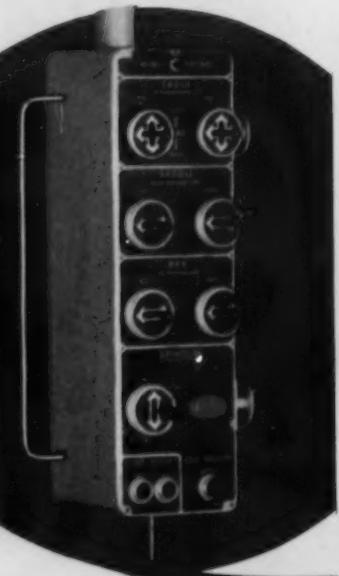
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Additional Features...

Both Screw and Rack Feed to the Spindle

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2. Lathe centers
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...and get all these advantages:

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2. Tough
3. Machines easily
4. Exceptional wear-resistance
5. High tensile strength
6. Withstands working pressure of 200,000 p.s.i.

BECAUSE it's an alloy steel of high carbon analysis, Timken® 52100 has high tensile and fatigue strength. It's fully spheroidized structure makes machining easier. It has high hardenability throughout its cross section and can be oil quenched to a maximum hardness of 65/66 Rockwell C.

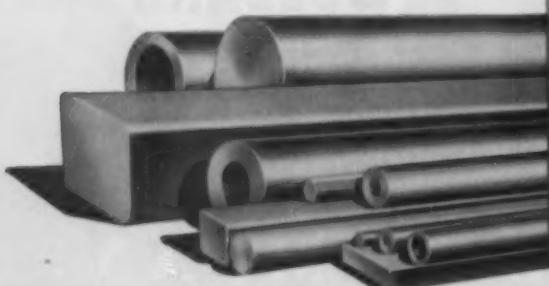
You can get 52100 steel from the Timken Company in all three finished forms: bars, tubes, wire. For your small run or emergency requirements, we maintain a mill stock of 101 sizes of 52100 tubing—from 1" to 10½" O.D. We can ship it in

less-than-mill quantities within 24 hours after you order.

You're assured of uniform quality in every shipment because we control quality at every step in production. The Timken Company is one of the world's largest producers of 52100 steel, and America's pioneer producer of 52100 tubing.

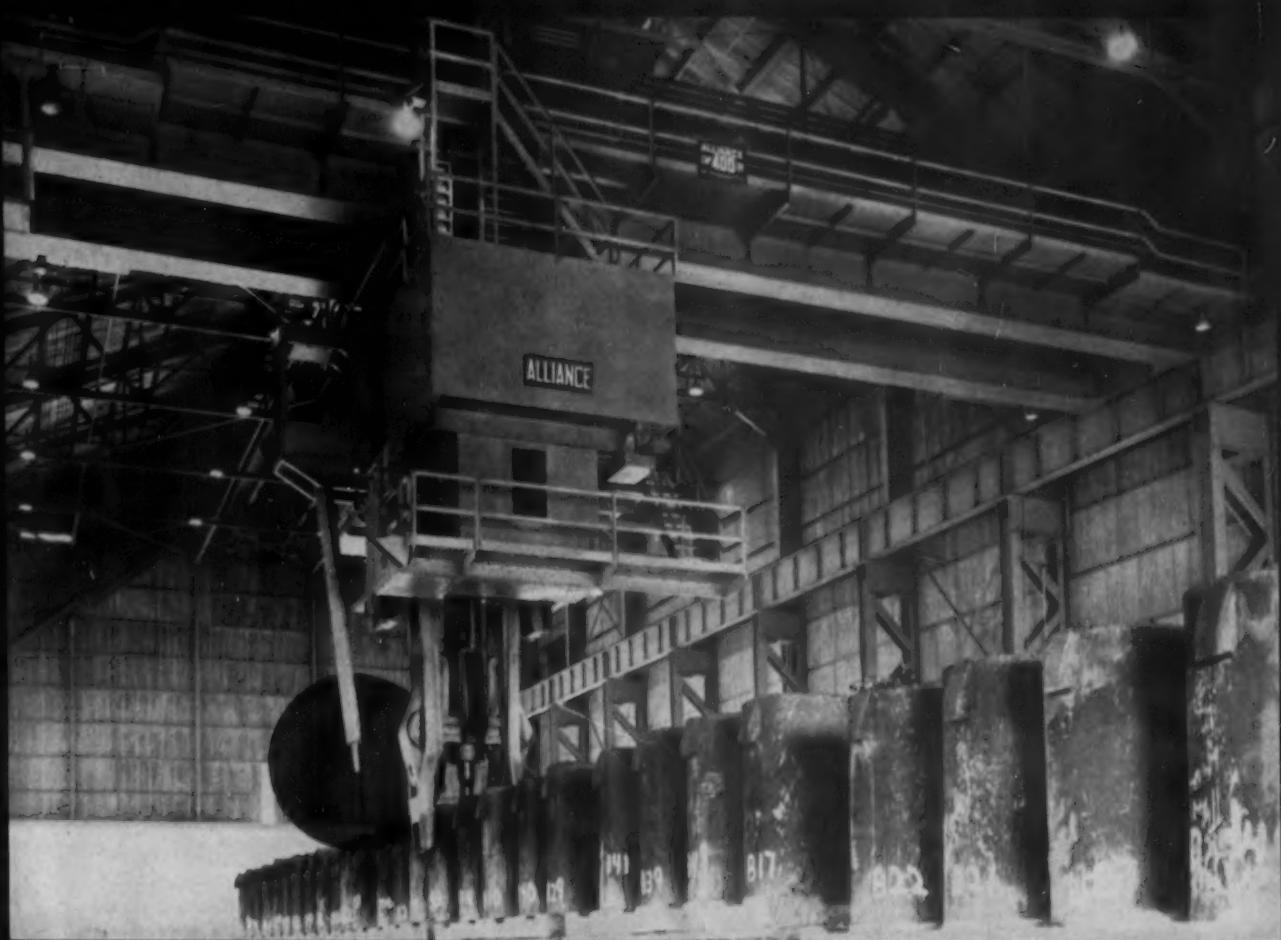
For a stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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Fine Alloy
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IMPACT STOOL LOOSENER REDUCES WEAR ON STRIPPER CRANES

The big 400-ton Alliance push-pull Stripper Crane exerts 2,400,000 pounds' pressure to strip moulds from ingots cleanly and frees stool stickers at the same time. It's done with the patented Impact Stool Loosener. It reduces wear on stripper cranes, eliminates jiggling by crane, sends ingots to the mill ready to go . . . no need to loosen them with soaking pit cranes. The Alliance Impact Stool Loosener can be installed on any stripper crane. Big Alliance strippers, with a nameplate rating of 400 tons and overload rating of 1200 tons, embody many exclusive design features . . . a result of Alliance's knowledge of mill procedures and problems. Have Alliance analyze your lifting needs. A letter, wire or phone call brings the information you require.

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To Tubing Users

From Babcock & Wilcox



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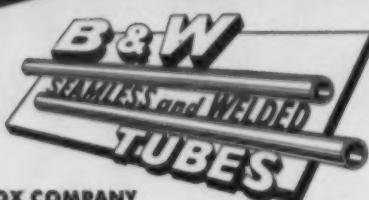
MILWAUKEE

In order to better serve tubing users B&W has steadily expanded its range of tubular products, over a period of several years, until today the Company offers a selection of seamless and welded carbon, alloy and stainless steel tubing to meet virtually all pressure and mechanical tubing requirements. In types, grades, sizes, lengths and finishes the tubing buyer may choose from literally millions of combinations.

B&W plants at Beaver Falls, Pennsylvania, and Alliance, Ohio, manufacture hot-finished, cold-drawn and roto-rocked tubing on modern equipment which has been constantly improved or enlarged to better serve tubing users.

To further diversify, B&W now operates a third tubular products plant at Milwaukee, Wisconsin. This mill manufactures mechanical and pressure tubing of stainless, alloy and carbon steel grades in a broad range of sizes. In addition it produces tubing of low carbon ingot iron, aircraft tubing, tubing of special shape cross sections as well as a variety of seamless welding fittings.

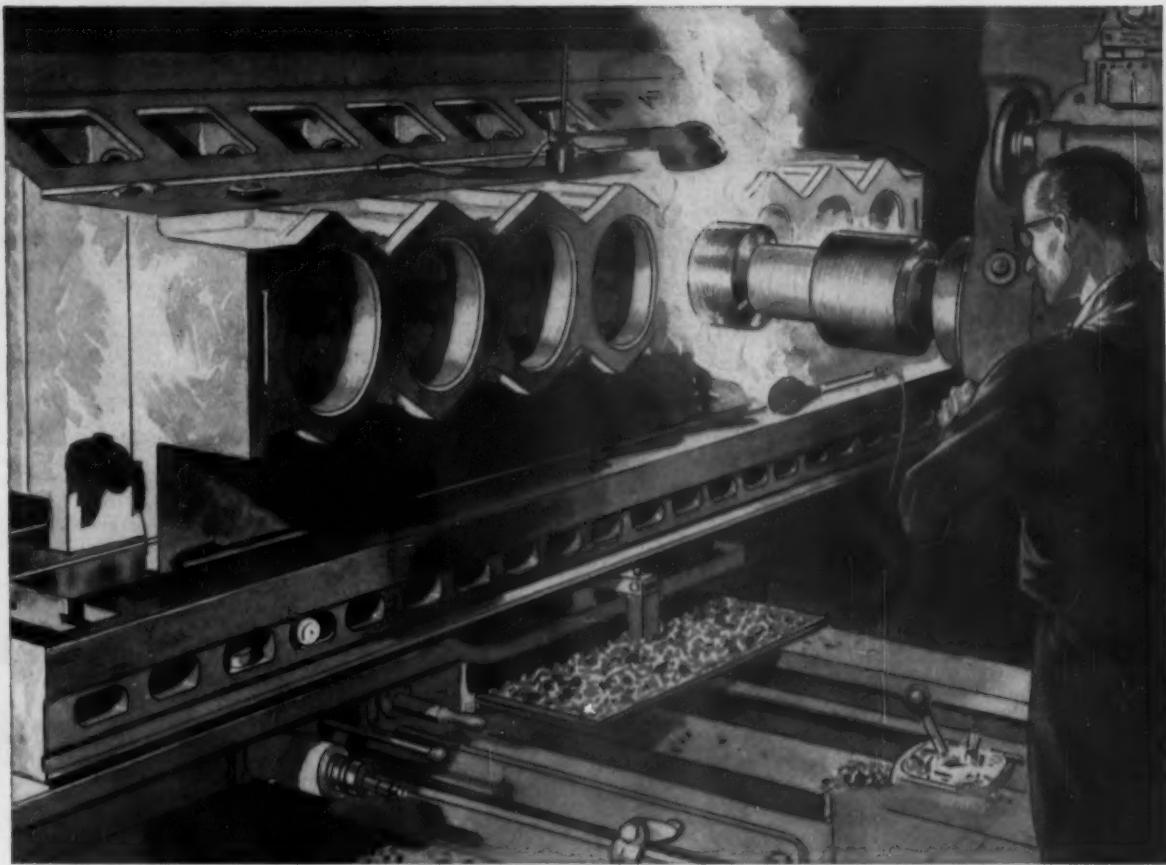
As always, B&W is dedicated to the high quality standards in the manufacture of tubing and pipe which have earned for B&W tubular products an outstanding reputation and the continued confidence of its customer friends.



THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing,
Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

TA-5001(G)



Insure good machinability with as little as 2 to 4 lb. of SMZ alloy per ton of Iron

Today's high-speed machining operations make it more important than ever to control the structure of iron castings. Castings with chilled corners and edges or hard spots may cause costly tool breakage and interrupted production.

An effective, low-cost method of insuring satisfactory machinability is the addition of SMZ alloy to the iron in the ladle. An addition of only 2 to 4 lb. per ton of iron is sufficient to reduce chill,

control the uniformity of structure, and produce castings with excellent machinability.

SMZ alloy is a balanced inoculant containing 60 to 65 per cent silicon, 5 to 7 per cent manganese, and 5 to 7 per cent zirconium. Further information about the advantages of using SMZ alloy will be gladly furnished on request. The ELECTROMET office nearest you will be pleased to answer your inquiry.

The terms "Electromet" and "SMZ" are registered trade-marks of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

OFFICES: Birmingham • Chicago • Cleveland • Detroit
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Electromet
TRADE MARK
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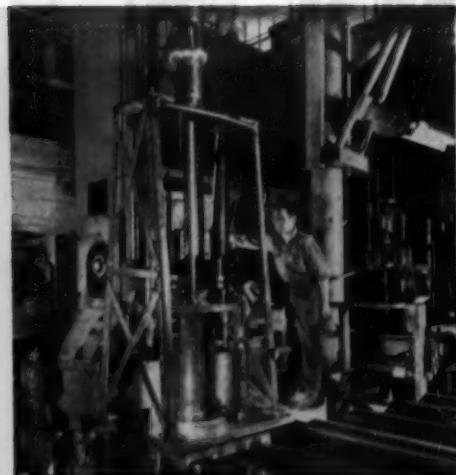
1. Welding The Main—Fittings and base plate are welded into the base of an oil hydraulic cylinder. The steel tubing must make a sound weld without warping.



2. Machining The Main—High speed threender (235 rpm) cuts close tolerance threads on the inside diameter for bronze packing nut and steel stop ring. Snug fit is essential to add strength to cylinder and prevent leakage under pressure.



3. Turning The Sleeve—The outside diameter of the sleeve is turned, and then ground to even finer finish. Straightness and concentricity in the tubing is most important. Proper stress-relief annealing of the steel prevents warping.



4. Honing The Sleeve—On this vertical honing machine, the inside of the sleeve (center) is finished to a 16 micro-inch finish for piston-ring fit to contain the hydraulic pressure when cylinder is operating.

How Strong Get

In order to increase production and reduce costs, all industry today is demanding greater performance from its tools. Equipment must carry heavier loads, lift them higher and faster—stay in service longer than ever before.

To accomplish this, strong, powerful arms of steel in the form of oil hydraulic cylinders are being used increasingly on industrial equipment, machinery, tractors, earth movers, loaders, lift trucks, portable drilling rigs. They transmit power smoothly, economically.

Among the producers of oil hydraulic cylinders, one of the largest and best known is the Commercial Shearing and Stamping Company of Youngstown, Ohio. It has developed precision methods of making heavy duty hydraulic cylinders that operate easily, yet contain the hydraulic pressures without leakage. To make them, Commercial starts with the best in cold drawn seamless mechanical tubing from experienced steelmakers such as Pittsburgh Steel Company.

• **One Example**—Take a look at the way Commercial produces just one of its many models: the two-sleeve telescopic cylinder used to erect the boom of a portable rotary drilling rig.

Each rig is equipped with two of



5. Grinding The Plunger—Here is a rigid test for any tubing. The plunger must be turned, ground, and polished to a mirror-like 16 mil with crocus cloth. The slightest imperfection would cause leakage under operating pressure.



6. 100-Per-Cent Inspection—Every cylinder made at Commercial is tested on equipment that develops the full pressure loads that are required under field operating conditions, and is thoroughly inspected during operation.



7. Raising A Rig—The double acting cylinders on this portable Franks rotary drilling rig develop an initial thrust of 35 tons in positioning the boom, and nearly 20 tons of pull when bringing it down. This is one example of the many models of oil hydraulic cylinders produced by Commercial.

Arms of Industry Their Muscles

these cylinders. They have a stroke of nearly 10 feet, providing an initial thrust of 35 tons. This lifts the boom from a horizontal folded position to a vertical extended position. To reverse the operation, the cylinder's double acting feature develops a thrust of nearly 20 tons on the pull stroke.

The tubular parts of each cylinder consist of a main, a sleeve, and a plunger. As the cylinder operates under oil hydraulic pressure up to 1,000 psi, the main provides the base for actuating the sleeve and plunger.

In production, these tubular parts are turned, ground and honed. Fittings are welded into position. Ends are threaded to hold packing nuts and stop rings. From start to finish, all operations require detailed scientific accuracy (see photos).

• **What It Takes**—You can readily see why the steel tubes for each cylinder must have special properties for this specific application.

Each tube must have uniform close dimensional accuracy, straightness, and concentricity, so that the amount of steel removed in turning, grinding and honing can be kept to a minimum. Extra time on these operations is expensive.

The steel must have machinability.

It can't be too soft or too hard. It must be clean in its chemical composition and clean on the surface. At the same time it has to weld easily. And it must take both machining and welding without warping. Finally, it must have extra strength for the variety of stresses that the load of raising, holding, and lowering the rotary drilling rig boom will place on it in field operations.

The mechanical seamless tubing supplied by Pittsburgh Steel for this cylinder ranges in size from 7.210 inches inside diameter with a wall thickness of .395 inches for the main, down to 3.250 inside diameter with a wall thickness of .313 inches for the plunger. It is a low carbon steel of inherent quality, cold drawn to exact

uniform size for easy machining and honing. It is stress-relief annealed to prevent warpage during manufacture. And it provides a tensile strength of over 60,000 psi.

• **What This Means To You**—Commercial uses Pittsburgh Steel's seamless mechanical tubing for this and many other types of cylinders because it can rely on excellent performance in production and high quality in the finished product.

If you have an application for seamless tubing, why not look into the opportunities Pittsburgh Steel can offer you? A phone call to the closest district office (see below) will bring prompt personal attention. Why not call today?

"Everything New But The Name"

Pittsburgh Steel Company

Grant Building

• Pittsburgh 30, Pa.

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Dayton • Detroit • Houston • Los Angeles • New York • Philadelphia • Pittsburgh
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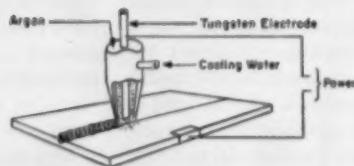
Write for your copy of the color brochure "The New Pittsburgh Steel Company."

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- Production
- Profits
- Quality

Whatever your fabricating needs—in small shops or on production lines, on carbon steel, complex alloys or non-ferrous materials—LINDE has a high-speed, cost-saving electric welding process for every job. Here is the line-up of this top-notch team...



HELIARC Welding—ideal for metals .020 in. and thicker . . . Joins all commercial metals in easy operations—attains speeds over 100 inches per minute . . . Welding is done in all positions on all types of joints with portable manual, semi-automatic, and mechanized equipment.

There is no slag, spatter, or smoke—the operator can see and control the weld puddle at all times. Weld finishing is seldom necessary, and investment and maintenance costs are low.

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A Division of Union Carbide and Carbon Corporation

30 East 42nd Street  New York 17, N. Y.

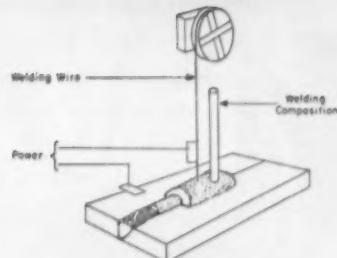
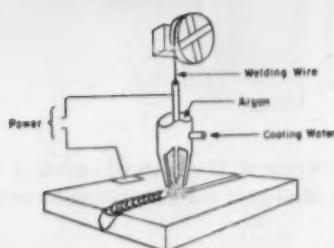
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Sigma Welding—4 times faster wire deposition than by manual rod feed methods . . . Full penetration up to $\frac{1}{4}$ -in. in a single pass . . . Joins all commercial metals—and attains speeds of more than 100 inches per minute on many operations.

Uses any d.c., or c.p. (constant potential) power supply. With c.p., an operator has only to set the wire feed rate—current remains essentially constant throughout welding. Both manual and automatic mechanized sigma welding equipment is easy to operate and maintain.

UNIONMELT Welding—joins metal of any thickness . . . Up to 3-in. thick in one pass. Extreme depth of penetration and high rate of wire feed make this the fastest and usually the most economical of all welding processes. Deep penetration or wide shallow beads are easily attained by UNIONMELT welding.

Both portable manual and mechanized setups are available, and can use any a.c., d.c., or c.p. (constant potential) power supply. With c.p., no control is necessary to maintain constant arc voltage throughout welding.

Start Saving Now — Call Your Local LINDE Representative Today . . .
Ask for Form 7942, "Modern Methods of Joining Metals."

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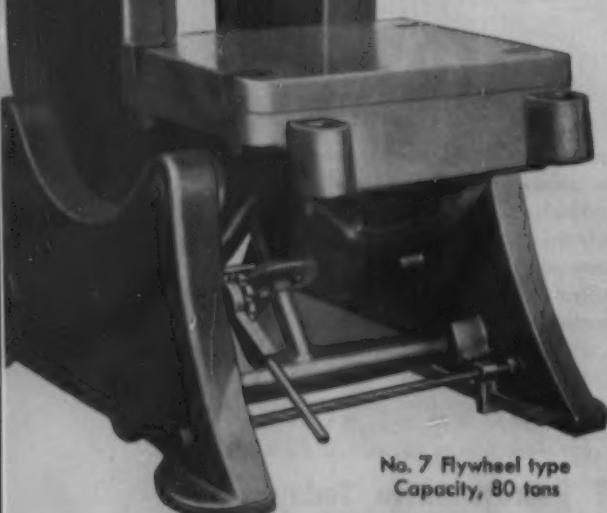
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• **Patented Brake Design.**

Spring tension permits expansion — available with automatic release, if desired.



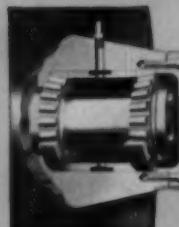
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No. 7 Flywheel type
Capacity, 80 tons



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An exclusive Federal feature.



• **Timken Bearing Flywheels.** Eliminate wear on crankshaft, readily adjusted.



• **Longer "V" Ways, Gibs.** Added speed, accuracy. Hand-scraped to perfect alignment.

plus **Oversized Crankshafts • Generous Shut Height • Front-Operated Recline**

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Friction? Wear? Galling?

Here is a Practical Answer!

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Instead of turning to costly and time-consuming redesign, they have specified *Electrolyzing*!

Electrolyzing increases the surface hardness of ferrous and non-ferrous metal parts, reduces friction to a remarkable degree and provides exceptional resistance to wear, abrasion and galling under heavy-duty cycles.

Electrolyzing is described in a 16-page booklet that answers nearly every question you might ask about the process . . . typical case histories . . . how high surface hardness is obtained . . . why Electrolyzing does not warp or distort parts . . . how dimensions are held to a tolerance of .000025"—and how part life is increased 2 to 10 times.



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Piston rods, sprockets and plungers are hardened by generator A; Hi-Brin pump tubes are annealed by generator B. The Speedomax C and Rayotube D, used with equal facility on either generator, help assure correct temperature for each heat.

Inset at right shows how the Rayotube detector is mounted only 4" from coil; it sights between the coils on work area only 0.1" in diameter . . . follows work temperature with a maximum time lag of only 0.15 second.

INDUCTION HEATING EFFICIENCY INCREASED with L&N Speedomax® and Rayotube®

Ever alert for better ways to assure a top quality product, Imperial Works of U. S. Steel's Oil Well Supply Division is now using induction heat treating methods. This Works at Oil City, Pa. now enjoys a new efficiency and versatility in the hardening and annealing of such items as piston rods and plungers for "Oilwell" pumps, Hi-Brin subsurface pump barrels and the various types and sizes of sprockets used in the drives of drilling rigs.

This heat treating equipment consists of two high frequency generators with an L&N Speedomax recorder and a small-target Rayotube detector. The recorder is mounted on a turntable between the two generators; this arrangement facilitates using the measuring equipment with either generator. As a result, each batch is hardened or annealed at the correct temperature. The elimination of guesswork reduces setup time, trial runs and rejects.

The piston rods, sprockets and plungers are hardened by generator A (see picture above). As the work moves through the coils, the Rayotube detector—mounted only 4" from the work—rapidly follows its temperature and the Speedomax

instrument records it. The Hi-Brin tubes are annealed by generator B. When annealing temperature is reached, a red light flashes, signalling the operator to shut off power.

By following these simple methods, the operator knows each time that he is on temperature, and Imperial Works is further assured of a uniform product because it has a reliable guide for establishing optimum temperatures and duplicating results.

If you're considering an induction heat treat, or if you want to be certain that your present equipment is giving you the utmost in efficiency, be sure to investigate the advantages to be had by using Speedomax and Rayotube. Contact your nearest L&N office, or write directly to 4956 Stenton Avenue, Philadelphia 44, Pa.

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1000 RPM
TESTED

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For the right finish start with Simonds Roll Grinding Wheels. Fast, cool, free cutting action. Used for regrinding and refinishing everything from giant back-up and work rolls to small jewelers rolls. Borolon (aluminum oxide abrasive) for steel and alloy steel rolls. Electrolon (silicon carbide) for chilled iron, cast iron, brass, copper and non-metallic rolls. Write for free bulletin ESA 237 "Roll Grinding Wheels for Surface Accuracy"

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**...with ONE
knife setting**

...SPEEDS PRODUCTION

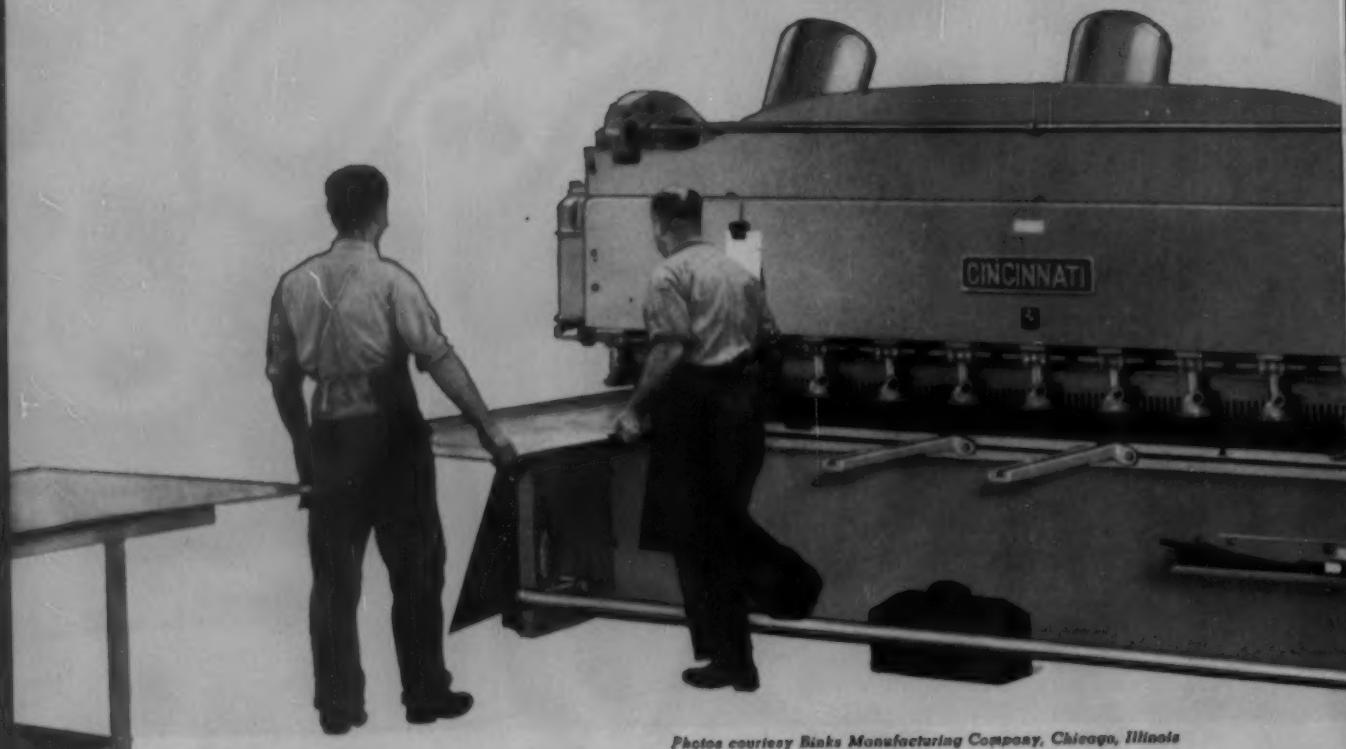


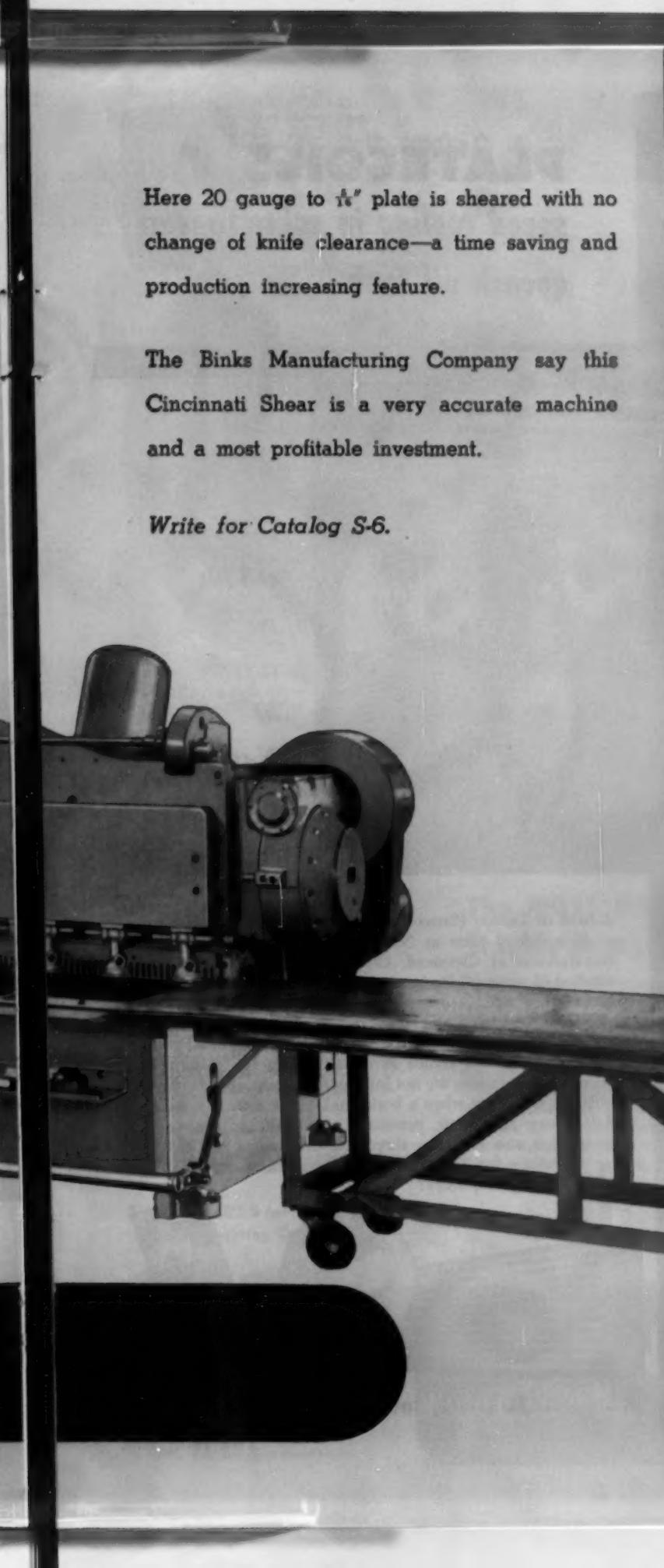
Photo courtesy Binks Manufacturing Company, Chicago, Illinois



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES



Here 20 gauge to $\frac{1}{4}$ " plate is sheared with no change of knife clearance—a time saving and production increasing feature.

The Binks Manufacturing Company say this Cincinnati Shear is a very accurate machine and a most profitable investment.

Write for Catalog S-6.



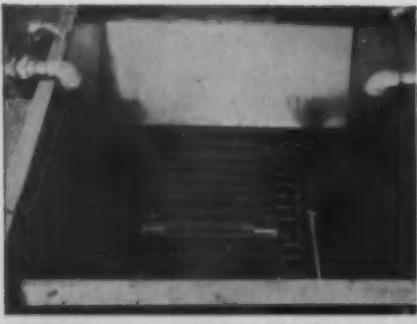
Water cooling tower



Dry auto spray booth

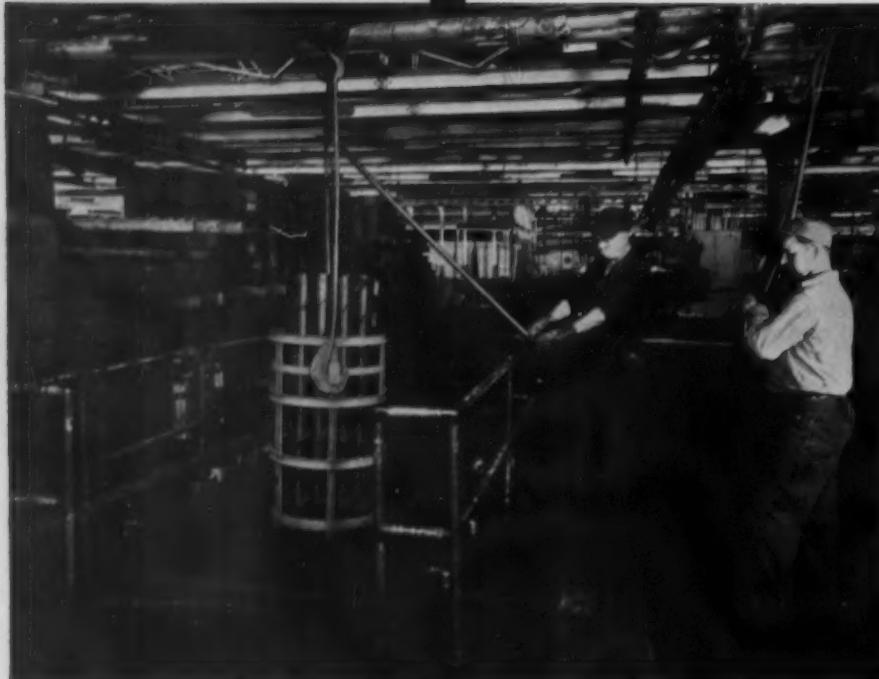


Water wash spray booth



PLATECOILS®

**speed cooling in subterranean
quench oil tank**



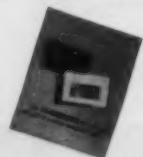
as
coil-it-is *
is
cured
at
National
Acme

PLATECOILS cure Coil-it-is*

Platecoils overcome the limitations and operating difficulties of pipe coils by heating or cooling 50% faster, taking 50% less space and saving up to 50% on initial and maintenance costs.



A bank of Tranter Platecoils is the key to speedier quenching of heat treated parts at National Acme Co., machine tool manufacturer at Cleveland, Ohio. The Platecoils, through which cold water is circulated, are in one section of a divided 2,000 gallon tank. Oil is pumped from this section into the bottom of the quenching half of the tank. At the top, oil spills over a baffle back into the cooling section, setting up a continuous flow of oil, cooled as it passes over the Platecoils. Quenching operations are not interrupted to wait for oil to be cooled as they were when a horizontal tube bundle was used. Maintenance and repair, previously a difficult and time-consuming job also has been simplified. Investigate the possibilities for Tranter Platecoil savings and efficiency in your plant, today!



For other examples and uses of Platecoil, write for Bulletin No. P73, a 12-company report.

PLATECOIL Div. TRANTER MANUFACTURING, Inc., Lansing 4, Michigan

BULLETIN 609—
Max Rating: 5 hp,
220 v, 7½ hp,
440-550 v.



Manual

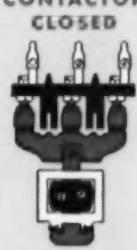


Bulletin 609

CONTACTOR
OPEN



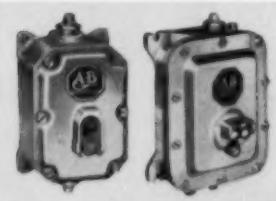
CONTACTOR
CLOSED



DOUBLE BREAK, SILVER ALLOY CONTACTS

The silver alloy used for Allen-Bradley double break contacts remains always in perfect working condition. Hence, there is no need for contact maintenance. You can install an A-B starter and forget it.

ENCLOSURES for Every Operating Condition



NEMA type enclosures are available
for Bulletin 609 and Bulletin 709 starters
to satisfy any operating requirement.

BULLETIN 709—
In 8 sizes up to 300
hp, 220 v, 600 hp,
440-550 v.

Automatic



Bulletin 709-Form 1

The MOST POPULAR MOTOR STARTERS Trouble Free . . . No Contact Maintenance

These two Allen-Bradley across-the-line motor starters . . . Bulletin 609 manual and Bulletin 709 magnetic . . . enjoy world-wide popularity because no matter what the service may be, they will not fail.

Both starters are simple, assuring long, trouble-free life. Both provide dependable overload protection to the motor. Both are push-button operated . . . one, mechanically through a snap-action linkage,

and the other, electrically with a solenoid plunger.

For continuous plant operation, specify either Bulletin 609 manual or Bulletin 709 solenoid starters. For maximum protection to man, motor, and machine, the Bulletin 709 is best. Its "no-voltage" protective feature prevents accidental restarting of motors after power interruptions. Write for the A-B Handy Catalog —6th Edition.

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

In Canada—

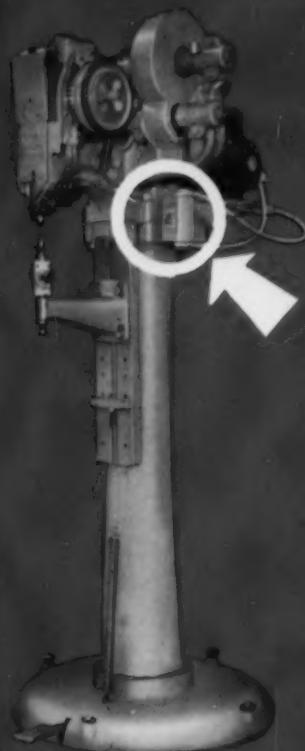
Allen-Bradley Canada Ltd., Galt, Ont.



ALLEN-BRADLEY
MANUAL AND AUTOMATIC STARTERS
QUALITY

A QUALITY STARTING SWITCH for SMALL MOTORS

Providing
Reliable Overload Protection



BULLETIN 600 MANUAL STARTER

for Motors of 1 Hp or less



With linkage lever & pilot light.



With standard lever & pilot light.



3-Way selector & pilot light.



With removable key switch.



NEMA Type 7
enclosure for hazardous dust or
gas conditions.



NEMA Type 4
enclosure for watertight & weatherproof service.

This compact toggle switch with a built-in overload breaker satisfies the National Electrical Code (Para. 4322 sub. C) covering overload protection requirements for motors of 1 hp or less.

QUICK MAKE & BREAK CONTACTS—The simple, rugged, over-center mechanism has a quick make and break action. No "teasing" of contacts means long contact life.

GENEROUS WIRING SPACE—Cover slips off, exposing front and both sides.

ATTRACTIVE APPEARANCE—The clean, modern lines are a sales asset to any machine. Enclosures listed for every service.

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

In Canada—
Allen-Bradley Canada Ltd., Galt, Ont.



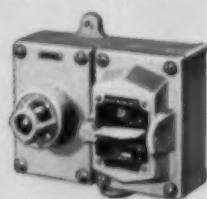
Flush mounting of two Bulletin 600 starters, each with a pilot light.



In a standard switch box.



In a surface mounted box.

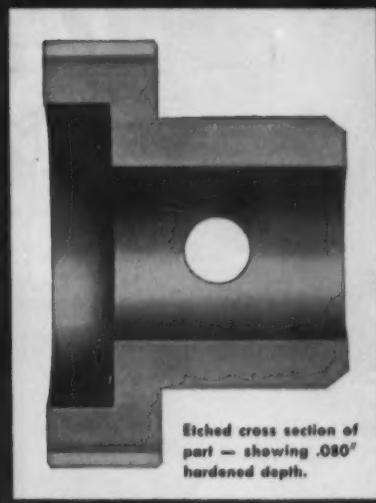


NEMA Type 4 enclosure with pilot light for use in wet locations.

ALLEN-BRADLEY
TROUBLE FREE MOTOR CONTROL



COSTS CUT 94%



Etched cross section of part — showing .080" hardened depth.

with TOCCO* Induction Heating

A cost reduction of 94% resulted when heat-treatment of this Corn Harvester part was changed from carburizing to TOCCO-hardening. Look at the unit cost breakdown:

CARBURIZING

| | CARBURIZING | TOCCO-Hardening |
|--------------------------|--------------------|---------------------------------|
| Degrease | \$0.0020 | <i>eliminated</i> |
| Carburize | 0.0200 | <i>eliminated</i> |
| 1st quench | 0.0150 | TOCCO, heat and quench \$0.0060 |
| 2nd quench | 0.0150 | <i>eliminated</i> |
| Draw | 0.0050 | <i>eliminated</i> (self-draw) |
| Shotblast | 0.0035 | <i>eliminated</i> |
| Internal Grind | 0.0243 | <i>eliminated</i> |
| External Grind | 0.0166 | <i>eliminated</i> |
| | \$0.1014 | \$0.0060 |

TOCCO-Hardening

"—Savings of 9½ cents per piece—\$4770.00 on each 50,000 piece batch, plus an hourly production increase from 120 to 300 pieces per hour, plus improved quality of the product by virtue of the deeper case and stronger core."

Have you investigated TOCCO's cost-savings possibilities for your hardening, brazing, melting or forging operations? Why not write us today or send blueprints of your parts —no obligation, of course.

THE OHIO CRANKSHAFT COMPANY



NEW FREE
BULLETIN

Mail Coupon Today

THE OHIO CRANKSHAFT CO.

Dept. A-3, Cleveland 1, Ohio

Please send copy of "TOCCO Induction Heating."

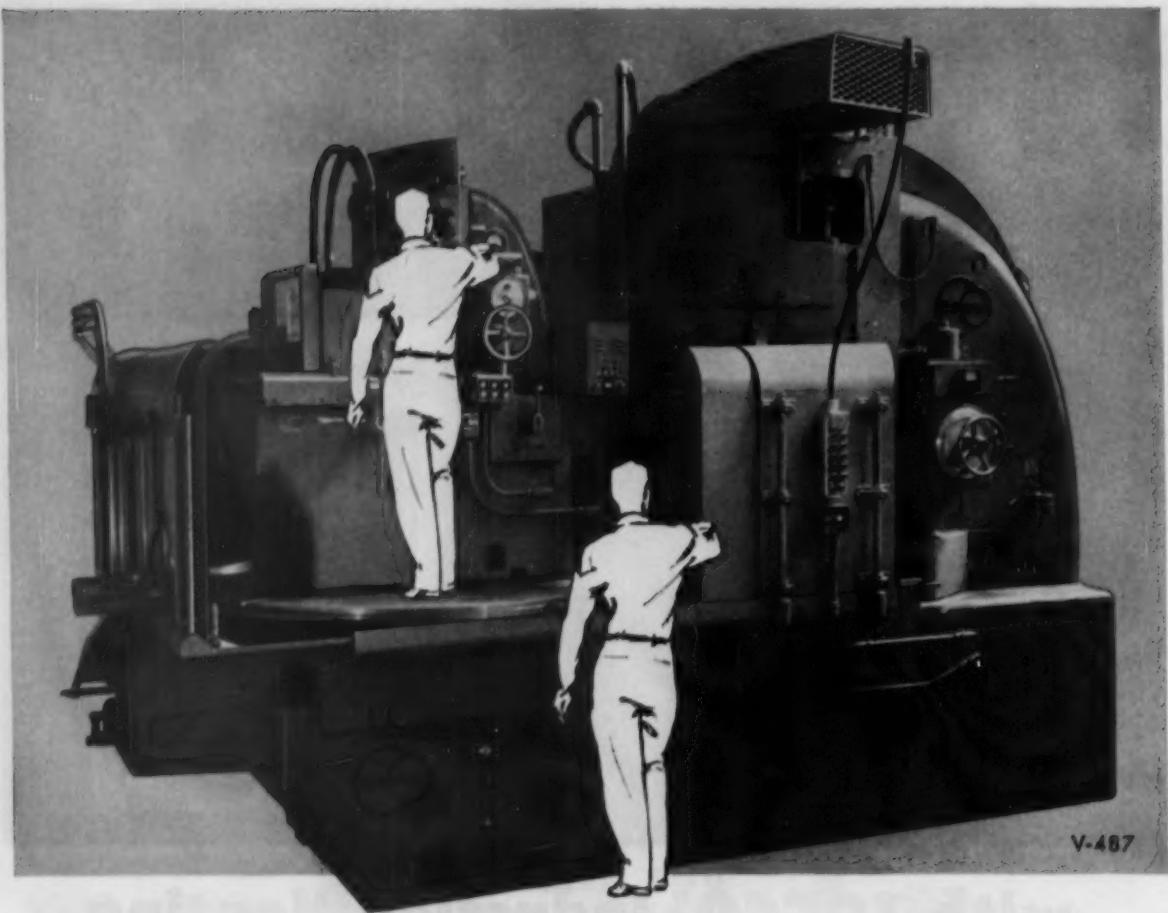
Name _____

Position _____

Company _____

Address _____

City _____ Zone _____ State _____



WE PUT ONE BLANCHARD ON ANOTHER ...to show you the wide range of sizes!

It's true! There's no "trick" photography involved. Our 5,400-lb. No. 11 Blanchard Surface Grinder fits snugly on the 84" chuck of our giant 61,000-lb. No. 42-84. And, like all Blanchards, both have chucks flat within .0002" - guaranteed!

Do every surface grinding job in your shop perfectly . . . whether you grind tiny watch parts - steel plates 7 feet across corners - or anything in between . . . *put it on a Blanchard.*

Whatever your requirements for stock removal, tolerances or surface finish, ask for details on the 15 standard Blanchard models today. One of them will fill your needs perfectly and will do your work with speed and precision - at costs which help you set competitive prices.



THE BLANCHARD MACHINE COMPANY

PUT IT ON THE **BLANCHARD**

64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

*Send for your free copies of
"Work Done on the Blanchard",
fourth edition, and
"The Art of Blanchard
Surface Grinding".*





The issue of *The Iron Age* you'll save for the next 100 years...

. . . because The Iron Age's "100 Years of Metalworking" will be the most comprehensive issue of a magazine ever published on metalworking.

In this 100th year commemorative issue you'll find a review of the past, a discussion of the present and—most important—a prediction of the future of every phase of the giant metalworking industry. The list on this page gives you just the bare skeleton of this giant editorial enterprise.

"100 Years of Metalworking" will be a treasured collector's item. And it will serve as a planning guide for future industry expansion and future technological development. The publication date is Mid-June. You'll receive it as part of your regular subscription to The Iron Age.

Watch for "100 Years of Metalworking" — Mid-June, 1955

WANTED

The earliest issues of The Iron Age
—first published in 1855
—still in existence in this country.

\$500.00 reward will be paid for the issue you discover and submit with the oldest dateline (send photostats or facsimiles—actual issues only if you are a contender). The issue shown at right is one of the earliest copies still on file in The Iron Age's office. Older copies may have similar characteristics.

For complete details of this reward write for set of rules governing entries.



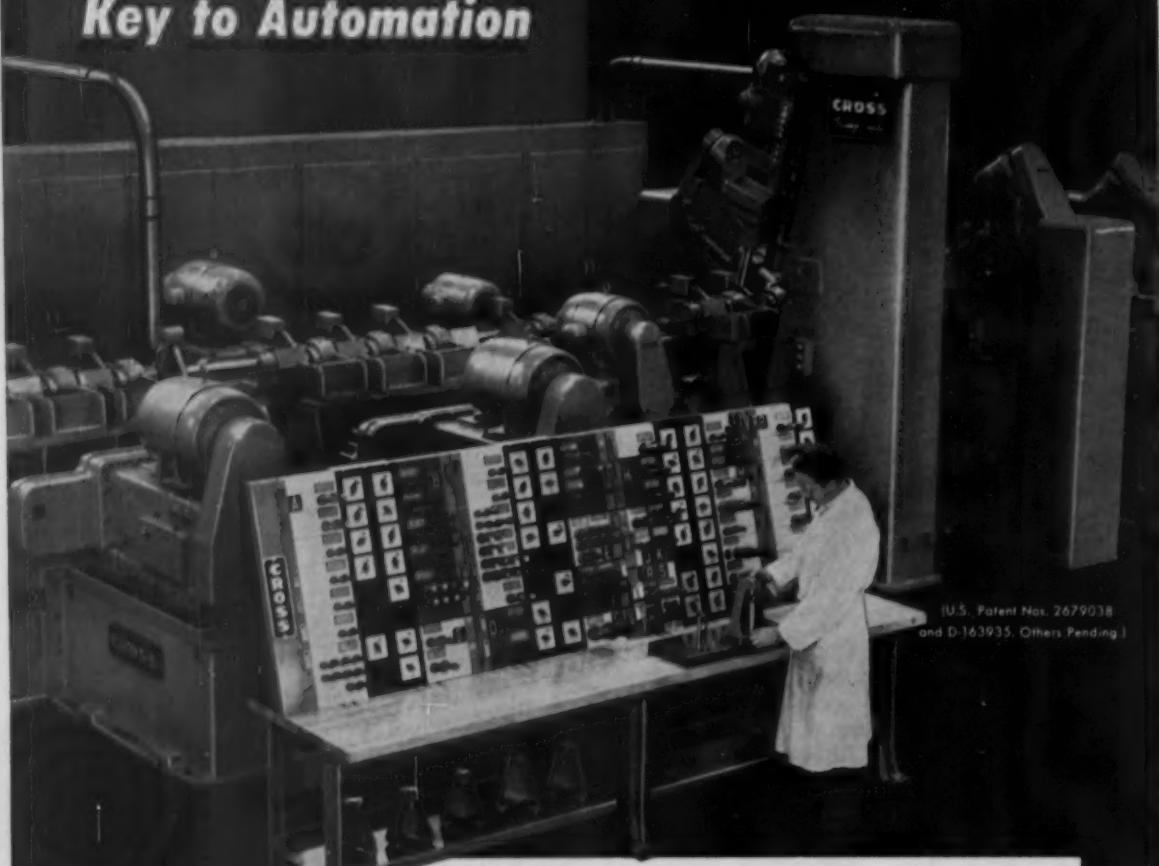
The Iron Age

Old Issue Information • 100 East 42nd Street, New York 17

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Cross Machine Control Unit— Key to Automation

*A Mechanical Eye
to Watch Your Tools*



[U.S. Patent Nos. 2679038
and D-163935. Others Pending.]

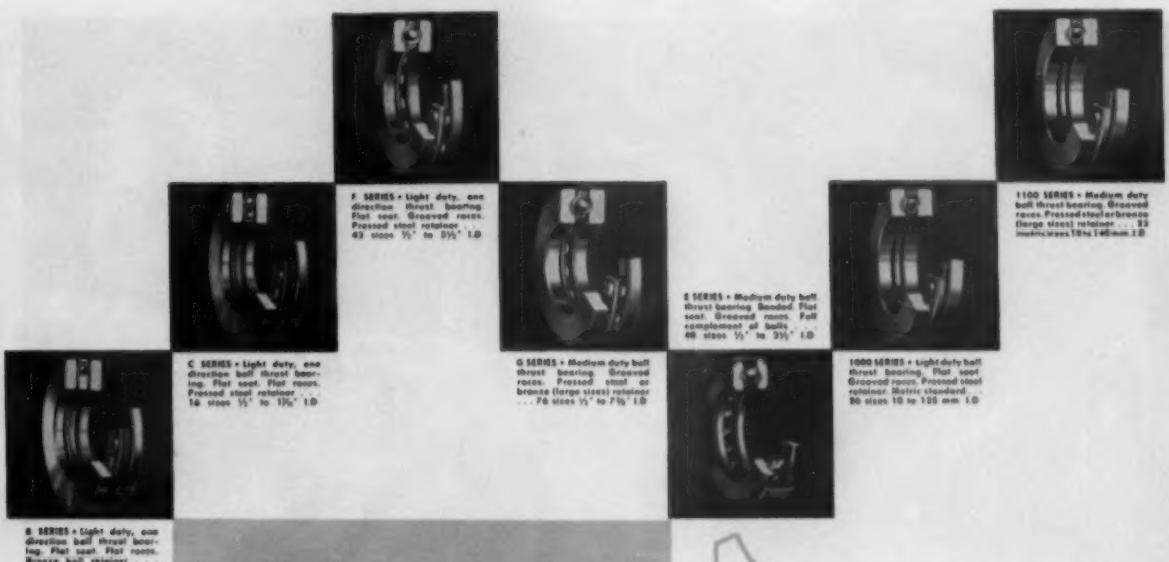
The greatly increased number of tools used in modern transfer-type machines makes adequate tool control a "must." The Cross Machine Control Unit was developed to meet this need—to cut downtime by programming tool changes . . . to reduce tool expense.

The Cross Machine Control Unit is equipped with Toolometers which furnish a visual record of used and unused tool life and automatically stop the machine when tools need changing. Other tools almost used up are replaced at the same time. This grouping of changes, plus the availability of pre-set tools which are stored in the Machine Control Unit, reduces downtime. And downtime for machine adjustments and trial cuts is eliminated because standard fixtures and gages are provided for pre-setting the tools.

Over 500 Cross Machine Control Units now in use are evidence of cost saving benefits. Get full information today.

Established 1898

THE **CROSS** CO.
DETROIT 7, MICHIGAN
Special MACHINE TOOLS



Where there's
industry
there's
Aetna



W SERIES • Case hardened and ground oil washers for $\frac{1}{2}$ " to $1\frac{1}{2}$ " I.D. and Spacer applications. Step flt. 38 sizes $\frac{1}{2}$ " to $2\frac{1}{2}$ " I.D.

1400 SERIES • Medium duty, one piece, deep groove ball bearing. Pressed steel or bronze (large sizes) retainer. 58 sizes $\frac{1}{2}$ " to $14\frac{1}{2}$ " I.D.



SPECIAL BEARINGS • Facilities for sizes up to 30 O.D. Contact that brings you the expert technical aid that industry's toughest bearing application problems.



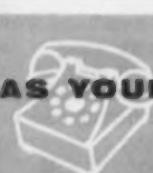
B SERIES • Ball thrust roller bearing. One piece, pressed steel, chrome type. 40 sizes $\frac{1}{2}$ " to $4\frac{3}{8}$ " I.D.



PRECISION PARTS • Aetna is versatile, can mass-produce special parts in almost limitless sizes and shapes to your most exacting mechanical tolerance and finish specifications.



CLUTCH BEARINGS • Ball bearing, roller bearing, bearing. Bonded. Pre-lubricated. Oil impregnated ball cage assures concentricity and smooth, quiet, long-life performance.



NEAR AS YOUR PHONE is a member of Aetna's close-knit, fully integrated organization—a representative, distributor or jobber ready to serve you, to intimately concern himself with

your bearing problems and in making certain you get fast, intelligent solutions. When a standard Aetna bearing isn't the answer he'll put Aetna's top-flight creative engineering team at your command—to work side-by-side with your own engineers in meeting your special ball bearing, roller bearing or miscellaneous parts requirements. Call him today! Look under the **AETNA** name in your classified 'phone directory. Or write directly to Aetna Ball and Roller Bearing Company, Division of Parkersburg-Aetna Corporation, 4600 Schubert Avenue, Chicago 39, Illinois.

TOP QUALITY BEARINGS AND PARTS FOR
EVERY BRANCH OF INDUSTRY

Aetna

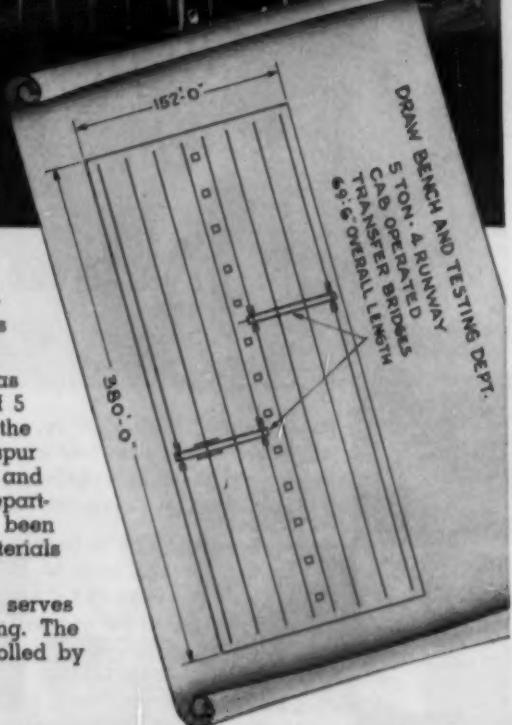


5 TON INTERLOCKING TRANSFER BRIDGES CUT HANDLING TIME

Careful planning in adapting the proper materials handling equipment to serve the large draw bench and testing department of a prominent copper company has paid real dividends because of resulting efficiency.

Instead of employing standard overhead traveling cranes as originally considered, two 4-runway transfer bridges each of 5 ton capacity are used, one on each side of the columns in the middle of the room. The bridges interlock with a short spur enabling a cab-operated carrier to travel from one to the other and provide complete materials handling coverage of the entire department. Thus time-consuming rehandling that would have been required with standard overhead cranes, in transporting materials from one bay to the other is eliminated.

The single cab-operated double-hoist carrier adequately serves the whole department and carries tubing up to 40 feet long. The carrier as well as the transfer bridges are completely controlled by the operator in the cab.



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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
4834 EAST 284th STREET WICKLIFFE, OHIO



CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

95%

of our presses are BLISS

that's why we're
"quick on the draw"
at BROIL-QUIK



Broil-Quik's famous Super Chef.

"In our fiercely competitive business, we have to have speed, dependability and little or no downtime," says John Simone, Superintendent. "With Bliss, we get it ... and more to spare. *That's why 95% of our presses are Bliss.*"

After consulting with Bliss engineers, Peerless Electric, Inc., New York, N. Y., makers of Broil-Quik rotisseries, chose the *right* presses for the jobs at hand—

- Bliss 28½ Inclinables—with their adaptability, rugged gap-frame construction and fast, dependable clutch operation—to draw and pinch off steel and aluminum blanks from 0.025" to 0.080" thick.

Bliss 3½ Toggle press cuts and deep draws (to 2 1/16") 1600 Broil-Quik side panels per shift from 0.028" cold rolled steel blanks.

- And a Bliss 3½ Toggle Draw press—with powerful blankholding pressure and rugged frame—to deep draw cold rolled steel blanks 0.028" thick.

Like Peerless, thousands of pressrooms are predominantly Bliss. For the fact of the matter is this: there are more Bliss presses in use today than any other make.

Chief among the reasons for this century-old standing is (1) Bliss makes more types and sizes of presses than any other builder; (2) Bliss "grinds no axe" for any one type. As a result you can be sure of impartial counsel from a Bliss engineer—you can count on him to help you pick the *one* right press for the job. Next time, do as thousands do, call Bliss first.

BLISS

SINCE 1857

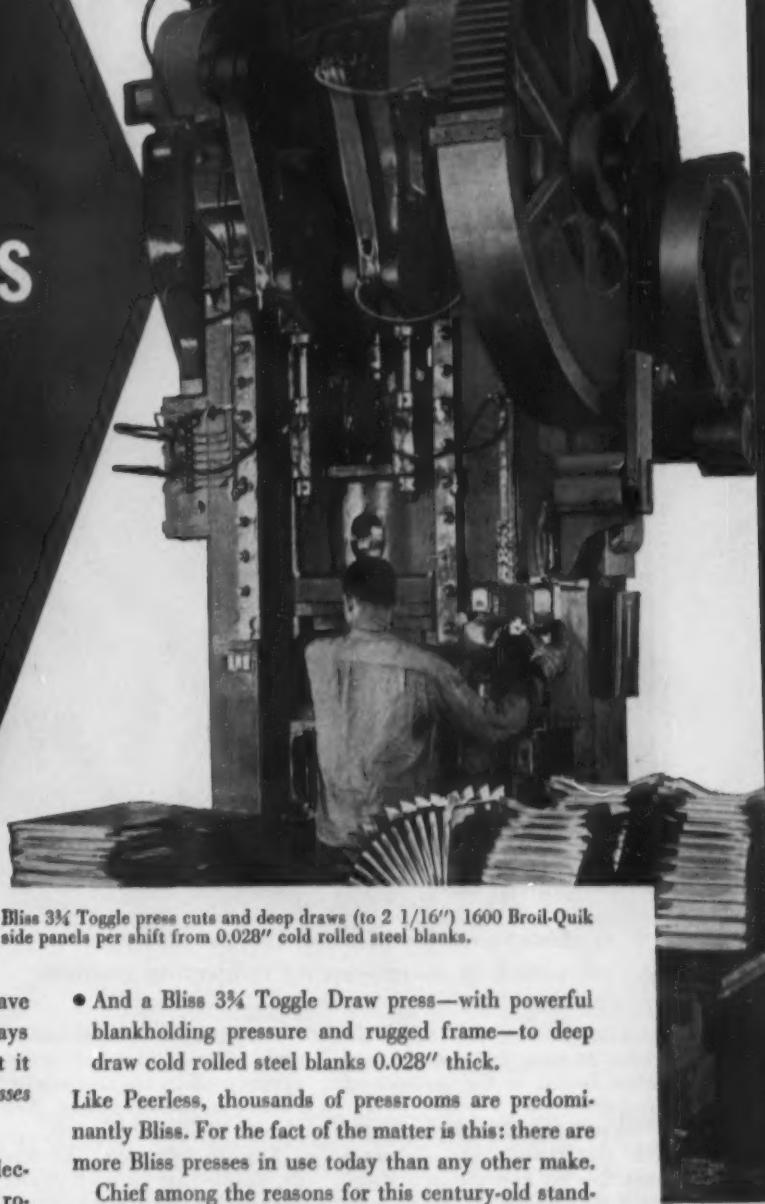
is more than a name . . . it's a guarantee

E. W. BLISS COMPANY
CANTON, OHIO
PRESSES, ROLLING MILLS,
SPECIAL MACHINERY

U. S. Plants in Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; San Jose, California.

Branch Offices in Buffalo, Chicago, Cleveland, Dayton, Detroit, Indianapolis, Los Angeles (Burbank), New Haven, New York, Philadelphia, Rochester, San Jose, Toledo, Washington, D. C.; and Toronto, Canada. Other representatives throughout the world.

E. W. Bliss (England) Ltd., Derby • E. W. Bliss Company (Paris) France



CORROSION-RESISTANT EVERDUR QUADRUPLES LIFE OF DEGREASING TANK



WELDING CHANNELS on side of tank with EVERDUR-1010 Welding Rods. Fabricated in 3 sections, this tank was welded and assembled by Storts Welding Company, Meriden, Conn.

Easy to work and weld, Everdur also proves adaptable to money-saving fabricating methods

Trichlorethylene—the solvent used in this degreasing tank—may break down to form hydrochloric acid when heated in the presence of moisture.

So serious is the corrosion problem that tanks made of ferrous materials, for example, have lasted no more than two or three years in this service.

The manufacturer's problem? To find a material that would not only resist this acid corrosion but also lend itself to low-cost fabricating methods.

After consulting with Anaconda's Technical Department, the manufacturer decided to fabricate the tank of EVERDUR®—ANACONDA's Copper-Silicon Alloy. Fabricating costs were low and tank life is estimated to be over twelve years.

Corrosion-resistant. EVERDUR resists corrosive attack by hydrochloric acid. It can't rust. And it is unusually strong, tough and fatigue-resistant. What's more,

EVERDUR is . . .

Easy to work. You can work and form EVERDUR plate hot or cold. EVERDUR alloys are also available for forging and machining. Weldability? You'll find EVERDUR . . .

Easy to weld, too. The inert-gas shielded-arc methods produce high-quality welds at good speeds and moderate cost, and with minimum distortion. This tank was welded with the argon-shielded tungsten arc, using $\frac{1}{8}$ " and $\frac{5}{32}$ " diameter EVERDUR-1010 Welding Rods.

EVERDUR Copper-Silicon Alloys are available in plates, sheets, rods, wires, tubes, electrical conduit and casting ingots. Your own equipment or corrosion problem will be given careful attention by our Technical Department. Write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

Reg. U. S. Pat. Off.



DEGREASING TANK 30' long, 6' high and 2½' wide and made of $\frac{1}{8}$ " EVERDUR-1010 Sheet.

EVERDUR
ANACONDA®

COPPER-SILICON ALLOYS

Strong • Weldable • Workable • Corrosion-Resistant

Rescue truck body of Yoloy built for rugged service



THE YOLOY FAMILY

High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

YOLOY
(Nickel-Copper)
Low Alloy High Strength Steel

YOLOY E
(Nickel-Chrome-Copper)
Low Alloy High Strength Steel

YOLOY M
(Manganese-Copper)
High Strength Steel

This civil defense truck must be ready to go under all conditions. To overcome unforeseen emergencies the Yoloy Family of steels is used advantageously in the construction of its all steel body.

The Yoloy Family of high strength steels have proven themselves to be extra ordinarily tough resistant to corrosion abrasion and wear. Their extra strength permits lighter construction with consequent valuable reduction in dead weight. That's why Swift All-Steel Body Co., Inc., Saginaw, Michigan, specified Yoloy "M" and Yoloy "E" for the light, strong body framing in this rescue truck.

Our District Sales Office near you is ready to supply information and service on the specific steels in the Yoloy Family best fitted to meet your requirements.

Youngstown

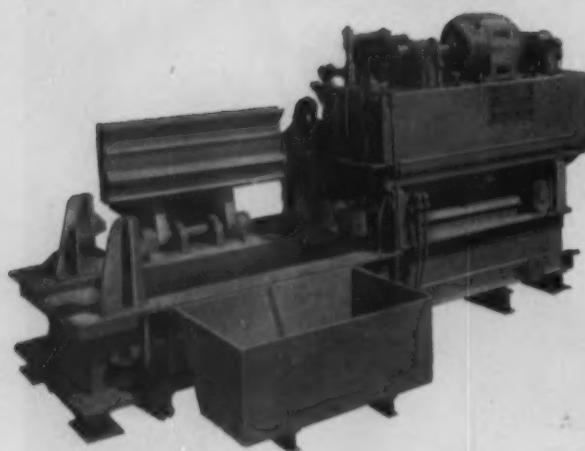
THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of
Carbon Alloy and Yoloy Steel

General Offices: Youngstown, Ohio • District Sales Offices in Principal Cities

SHEETS - STRIPS - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT
AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE -
HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

Choose One of the 6 DEMPSTER-BALESTERS...Offering



FOR PORTABLE PRODUCTION

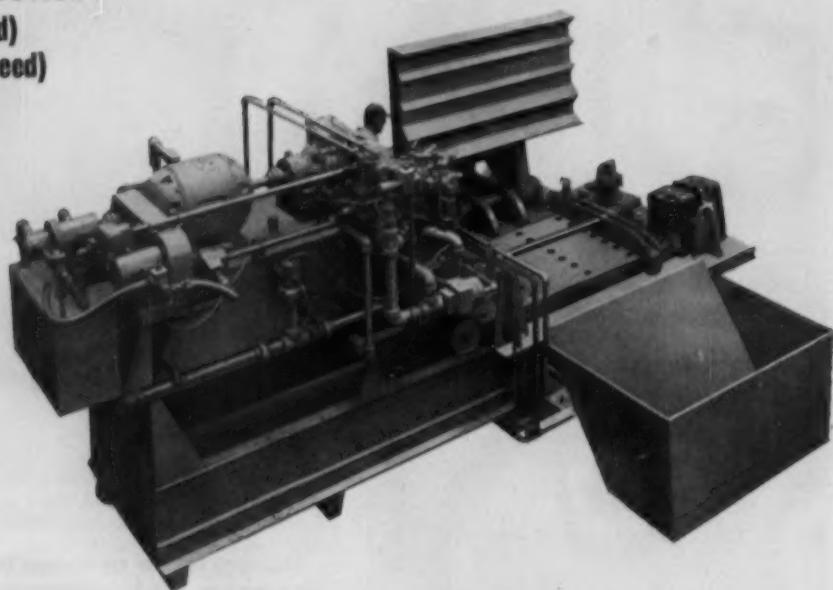
Model "125" (Standard)

Model "128" (High Speed)

WIDELY RECOGNIZED for top production and low cost operation, Dempster-Balesters are making scrap metal baling highly profitable in over 200 cities and almost every state of the union, as well as 15 foreign countries. The key to the greater profits provided by Dempster-Balesters is due, chiefly, to the 1-2-3-4 hydraulic operation, illustrated in detail in photos below.

Low cost operation is another important factor. This low cost operation is the result of simplified engineering and construction. All hydraulic assemblies are integral to the machine itself. Even the Standard Model 600 and High Speed Model 700 (pictured at right on opposite page) are self-contained requiring no air compressors, springs, counter-weights or supplementary equipment.

Without question, Dempster-Balesters are your best possible buy. And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour. For complete information, write to us today and ask for Catalog No. 530. A product of Dempster Brothers, Inc. *IN CANADA: Manufactured by Hamilton Bridge Co., Ltd. and sold by W. P. Favorite Co., Ltd., 418 Main Street East, Hamilton, Ontario.*



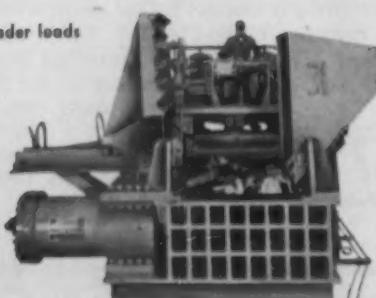
FOR LARGE PRODUCTION

Model "275" (Standard)

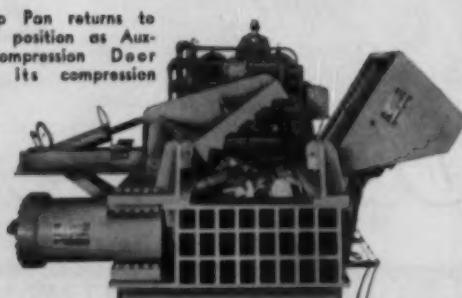
Model "350" (High Speed)

Action Photos below illustrate Dempster-Balesters

1 — Skip Pan Loader loads charging box.



2 — Skip Pan returns to loading position as Auxiliary-Compression Door starts its compression stroke.



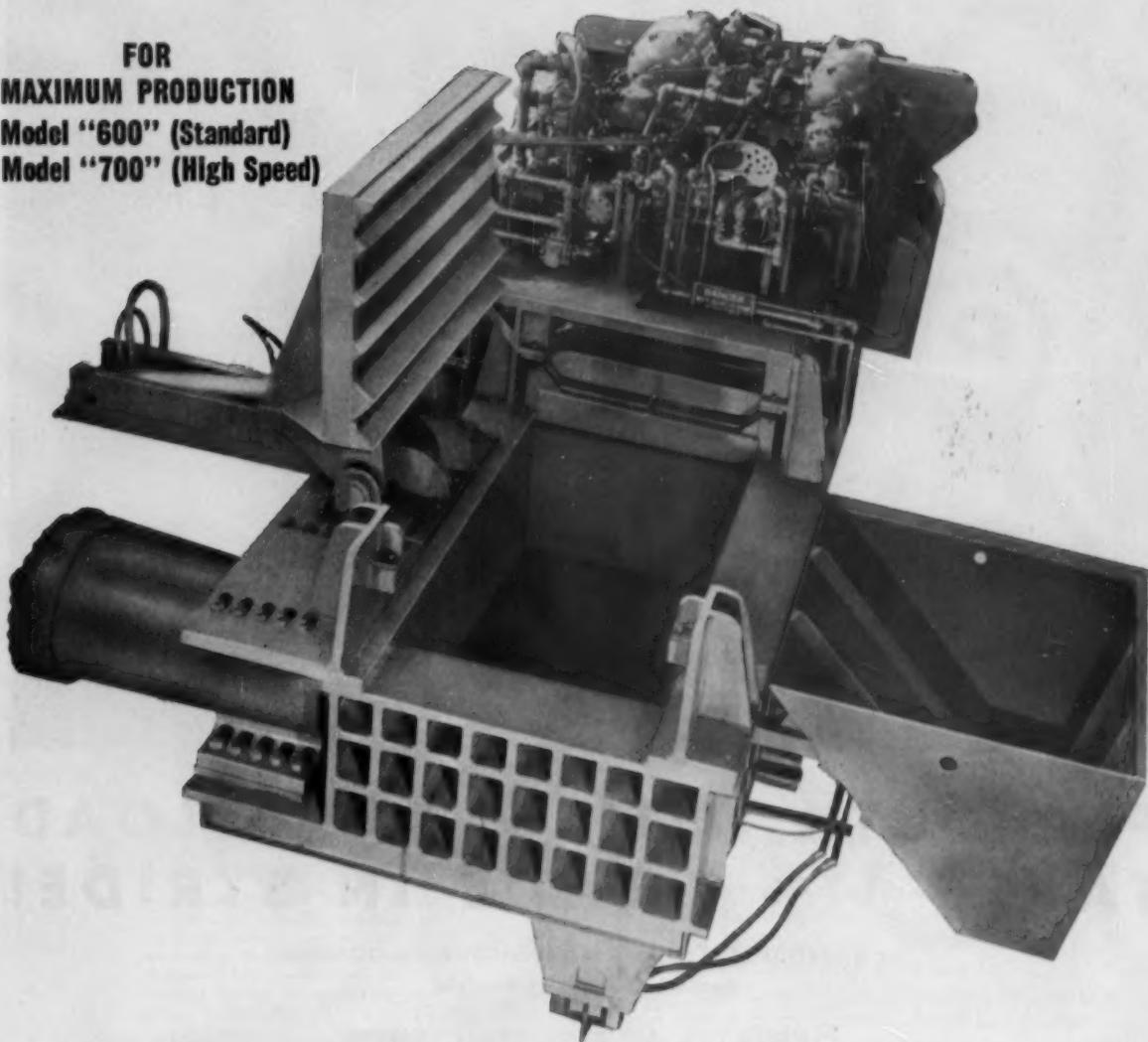
AD 4208

● D E M P S T E R

THE IRON AGE

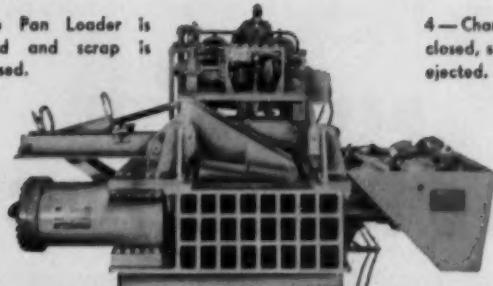
You the Closest Approach Yet to "AUTOMATIC BALING"!

FOR
MAXIMUM PRODUCTION
Model "600" (Standard)
Model "700" (High Speed)

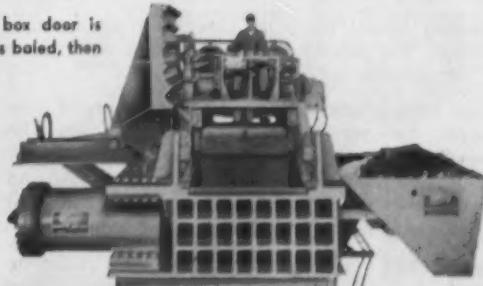


Fast and Power-Packed 1-2-3-4 Hydraulic Operation

3—Skip Pan Loader is re-loaded and scrap is compressed.



4—Charging box door is closed, scrap is baled, then ejected.



B R O T H E R S 435 N. KNOX, KNOXVILLE 17, TENNESSEE



PLYMOUTH WITH FULL PAYLOAD TAKES 11% GRADE IN STRIDE!

for BARBOURSVILLE CLAY MANUFACTURING COMPANY
Barboursville, West Virginia

OPERATES AT 98% EFFICIENCY!

Month after month, this 4-Ton Plymouth Model PL-2 Locomotive operates a minimum of 175 hours a month over an 11% grade with only 2 hours out for routine maintenance. That's 98% efficiency!

Hauling heavy loads of clay from pit face to crusher, this powerful Plymouth keeps costs down . . . production up!

"Our track grade is about 11% with plenty of tight curves, but our Plymouth handles the job with ease," states Mr. Herbert Desais, company superintendent. "Moreover, we like its economy and simplicity of operation. Continuous operation eight hours a day takes only 15 gallons of gas."

You will find every Plymouth designed to "make the grade" with tough hauling jobs. Models range from 3 to 70 tons, with gasoline, Diesel, or Diesel-

Electric power and mechanical or Torqomotive* Drive. Get full information by writing for free catalog or sending a brief of your operating requirements. Address: PLYMOUTH LOCOMOTIVE WORKS, Division of THE FATE-ROOT-HEATH COMPANY, Dept. A-2, Plymouth, Ohio.

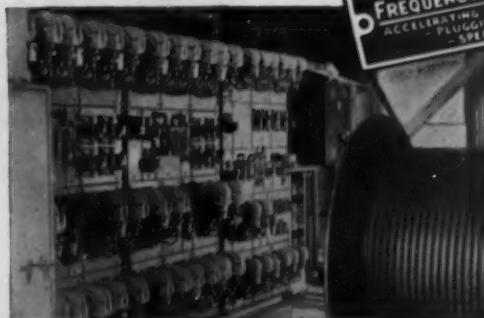
PLYMOUTH® TORQOMOTIVES

*Torqomotive Drive: Plymouth transmission with hydraulic torque-converter.

ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY



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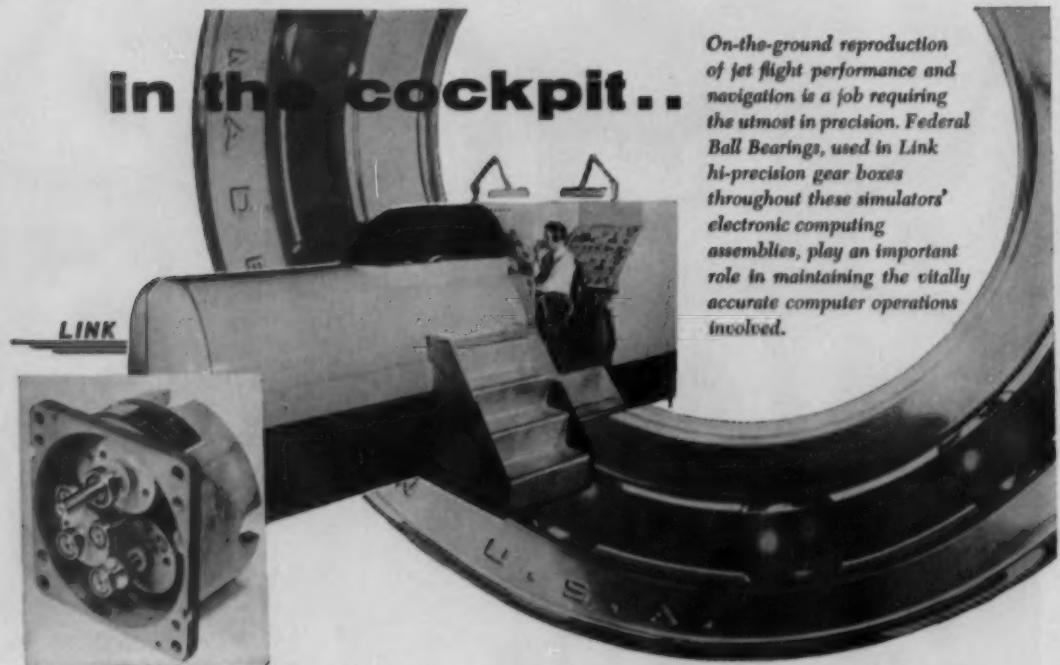


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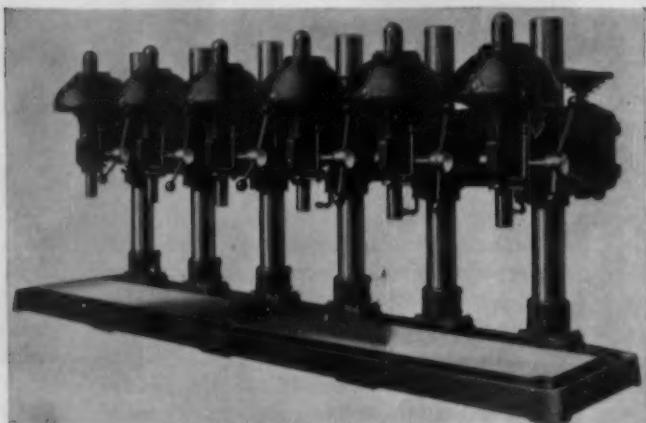


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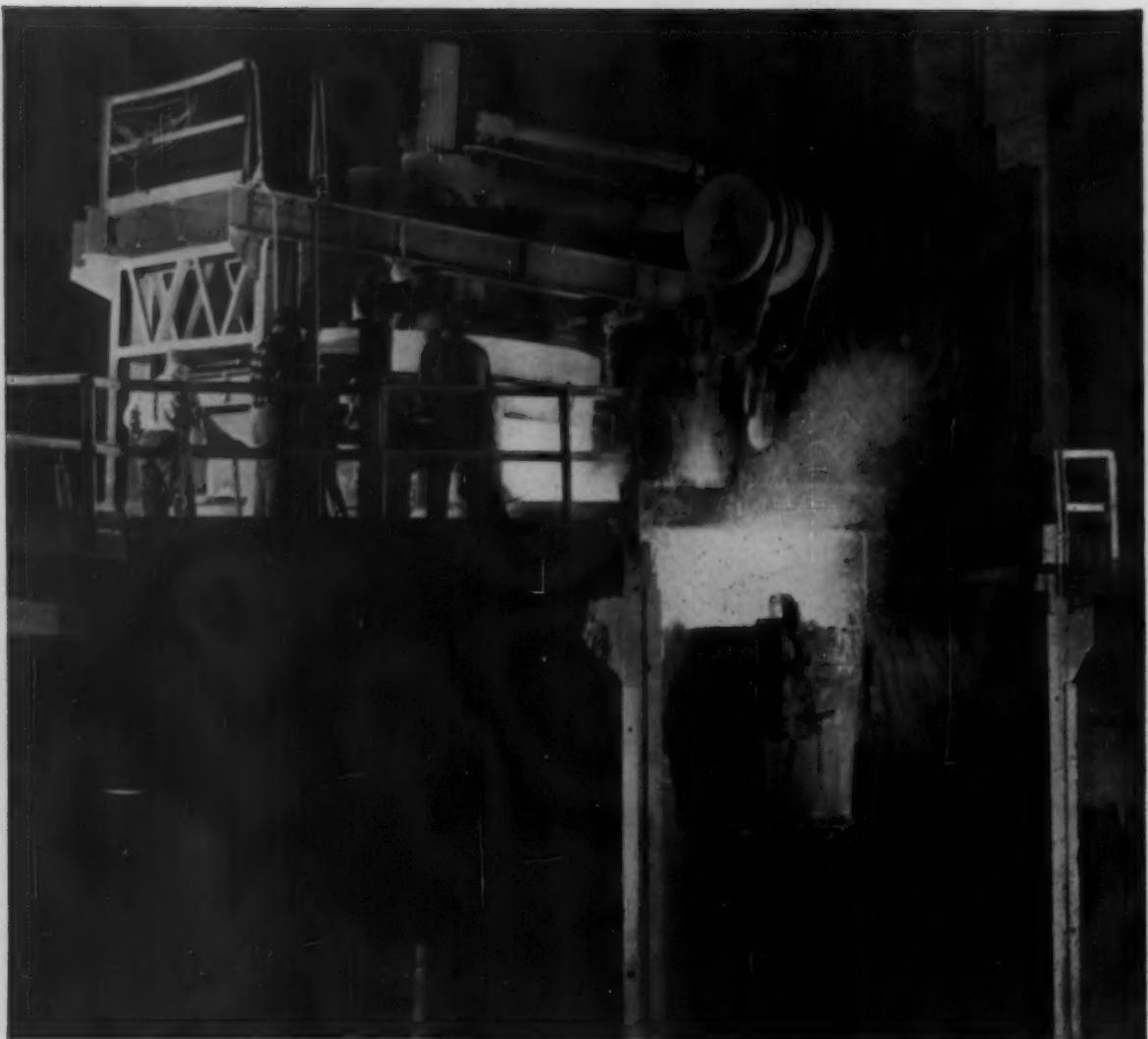
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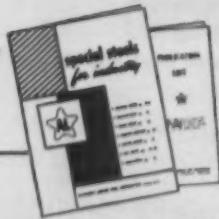
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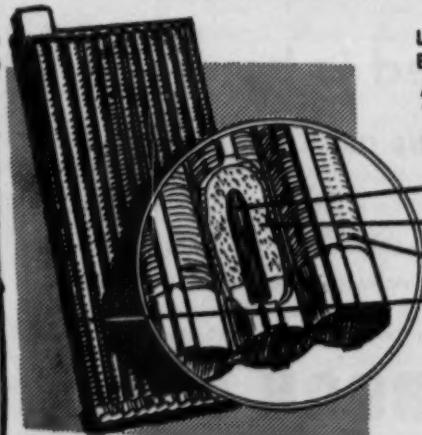
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FORECAST

The Iron Age Newsfront

Link Titanium Fatigue to Finish, Hardness

Though test data is not yet complete, it is pretty well established that surface finish, surface hardness and metal fatigue in titanium have a positive correlation. Full test results will probably not be announced until late this year.

Steel Negotiations: Peaceful Settlement

Steel labor negotiations this year will probably be limited to wages. Other issues, including the guaranteed wage, are ruled out under existing contracts. Chances of a peaceful settlement are good. Nonetheless, steel union officials are not likely to settle for anything less than 8 to 10 cents an hour wage increase.

Low-cost TV to Monitor Plant Operations

A closed circuit TV system for about \$1100 (camera and lens) can now be obtained for monitoring plant operations. The new small camera, only slightly larger than a cigar box, can be hooked up to a standard television set. The hookup works well with normal outdoor lighting. Some additional artificial light is needed for implant work.

All-Basic Openhearth Offers Advantages

The all-basic openhearth furnace continues to look better to industry. Though certainly not the rule, it has been established that a potential 20 pct advance in steelmaking capacity is possible, with little advance in fuel consumption.

Blown Shell Molds May Be Faster, Cheaper

Present investment method of making shell molds could become obsolete in the near future, some foundry experts believe. Their feeling is that the cold and hot mulled sand process, and the blowing of shells through the use of contour plates will prove faster and use considerably less resin than present methods.

Forecast Longer Tool Life With New Carbide

A new cemented carbide grade that may cut to four the number of grades required for steel

cutting operations will be placed on the market late this month. Makers of the carbide say it will result in higher tool life while greatly simplifying problems of tool selection.

Wider Use of Briquetted Scrap Seen

Future openhearth scrap shortages may be alleviated by use of "briquettes" converted from blast furnace scrap grades. Basically experimental for the last five years, they are now being produced with a specific chemical analysis. Equal in quality and price to No. 1 heavy melting, future production forecasts range to 100,000 tons per month.

Tubeless Tires Reduce Truck Downtime

Substantially reduced downtime for trucks and a big reduction in weight make a strong argument in favor of new tubeless tires now being offered. A truck carrying 50 pct overload recently completed a 3200 mile test run with eight nails in the tires with no loss of air. Weight saving with tubeless truck tires may reach 40 lb per axle with dual wheels.

Roll Close Tolerance Nickel Clad Strip

Ultra-thin, precision rolled nickel clad steel strip, in thicknesses as low as 0.003 in., ± 0.0001 in., is being rolled on a production basis by one company. The nickel clad steel strip, possessing high-temperature oxidation resistance, has a number of important electronic part applications.

Care Lessens Titanium Fire Hazards

Spontaneous combustion in fine, oil-covered titanium chips recently set off a fire at one plant yard which could not be extinguished with water, soda or CO_2 . Study showed Ti dust is explosive and may ignite spontaneously if dispersed in air. Fine turnings can be ignited with a match. Coarser turnings are difficult to ignite and present slight fire hazard. Absolutely dry sand or dry compound extinguishing powder is recommended in case of fire.

a CMP cost cutting report

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BEFORE

This manufacturer of intricate machine parts had numerous fabrication problems with standard specification cold rolled strip steel. First, the gauge tolerance variance presented difficulty when finished parts went to assembly where a close fit was required, causing many rejects. Production slow-downs were frequent and costly. Die life was shortened, too. Even though the parts are small and produced in great quantities where cost of steel per piece is insignificant, the resulting finished product cost was mounting because of the difficulties and added manual work.

AFTER

Presenting the CMP story of "specific specs" to the purchasing department of this manufacturer, a CMP representative was invited to meet with their production management. He suggested several different specifications for the various items they were producing and arrangements were made to test run the "specific spec" steel for their own check.

Improved results were immediate and final specifications for all items were established as best for each job. As was later related, the production chief said, "While our steel cost went up, we so completely beat our production and assembly problems that those savings dwarfed the steel cost." Perhaps there is an answer for your requirements, too, in CMP "specific specs" cold rolled strip steel -- we'll be glad to explore it with you.



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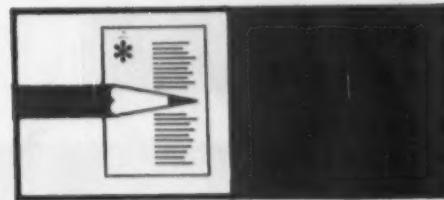
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Steel Market Paced by Inventory Buying

What looked like a sizable steel stock only 2 months ago seems too low today . . . Buyers underestimated market strength . . . Now are faced with struggle to rebuild inventories—By J. B. Delaney.

• STEEL CONSUMERS are learning an old lesson all over again: Inventories are only relative.

What looked safe 2 months ago seems dangerously low today. Some consumers are downright worried. The rest are fighting desperately to maintain position on mill schedules.

Before the current groundswell runs its course, steel users who played their inventories too close to the vest will pay the penalty for underestimating the market.

(Inventories include steel in transit from mills, steel in consumer plants, and consumer products finished but not shipped)

What happened is an old story in a slightly different setting. It probably will happen again unless consumers learn a better way to forecast market trends.

Steel actually began to recover from its slump last August. But consumers could afford to be complacent. They began the year with a whopping 17 to 18 million tons of inventory and were living off their own fat.

At year's end this inventory had dwindled to some 12 million tons. Producers were warning that it might be wise to take another look at steel stocks.

But deliveries were still relatively easy on most products, and consumers were riding their luck for all it was worth. Besides, steel ingot capacity had gone up another notch and there seemed little to worry about.

Then the lightning struck.

Cold-rolled sheets, galvanized, and enameling sheets were tight and getting tighter. Electrical sheets were gaining strength fast. Hot-rolled sheets began to move up. Strip demand was coming to life. Stainless was improving. Tinplate demand was strong.

Subsequently, heavier products moved into the picture. Bars were slow to recover but they're becoming

more of a factor now. Oil country goods strengthened. Linepipe joined the parade and carried plates with it. Merchant pipe had maintained a steady pace. Seasonal influences stirred structural demand. Europe came in heavily for semi-finished and tinplate. Demand for manufacturers' wire picked up early. The farm mar-

Steel Inventories . . . Peaks and Valleys

Ups and downs of finished steel inventories have a way of reflecting consumer thinking on the outlook for labor and international events as well as prospects for future business conditions.

THAT STRIKE IN '52

There was a tremendous buildup of inventory prior to the 2-month steel strike of 1952. Unofficial estimates run as high as 20 million tons. After the strike, consumers held an unbalanced stock estimated at 11 million tons.

BUILDPUP AND THEN CUTBACK

Still shaking from their close shave in 1952, steel's customers rebuilt their stocks to approximately 17-18 million tons. Then came 1954, a year of easy availability coupled with continued labor peace in steel, and consumers decided they could afford to buy less and reduce their inventories. By the end of the year, finished steel stocks were down to an estimated 12 million tons.

INVENTORIES WILL BE UP—SLIGHTLY

This year, consumer thinking has reversed itself. Steel customers are trying to rebuild their inventories, probably with some success. But despite increased steel productive capacity, the buildup will not be spectacular. At the outside, estimates are that consumers will be able to add 2 million tons to their supply, bringing inventories up to about 14 million tons at year's end—just 3 million tons above the 1952 post-strike low of 11 million tons.



STEEL pours from ladle into ingot mold as Republic's Canton, Ohio, plant casts 150 millionth ton. Stainless grade shown comes from 70-ton electric furnace, will be made into compressor wheels for jet aircraft.

ket came to life and revived the merchant wire mills. Construction wire products moved up as builders lined up their supplies for the construction season.

Warehouse demand lagged but latest reports indicate a slow but steady improvement.

What some consumers had overlooked was that steel demand tends to compound itself. One industry feeds on the other. The recovery in automotive stimulates a pickup in supplier industries. The same goes for appliances, and so on. Net result: A chain reaction among steel consuming industries.

Stocks Climb Slowly

Aggravating the situation is a reversal of the psychological factors that contributed to the late '53, first-half '54 slump.

And for good measure, consumers are now trying to rebuild their inventories on top of better demand for their own products. It looks like a slow process. Unofficial estimates are that maybe 2 million tons will be added to stock

by end of 1955, for a total of 14 million tons—about 3 million more than the poststrike inventory in 1952.

For the steel buyer, the market picture probably will get worse before it gets better. Consumers have one eye on labor, the other on the international scene, particularly Formosa.

Labor is responsible for some hedge buying. Outlook for a peaceful settlement in steel labor is good, but some consumers take nothing for granted. Automotive labor is more uncertain, and could be an important factor in sustaining high level car production until the die is cast one way or another.

Steel Rate Up to 90 Pct

Potentially explosive Formosa has prompted some usually conservative steel sales officials to warn consumers to rebuild their inventories.

Meanwhile, the steel ingot rate has moved up to 90 pct of capacity. This means that producers are using so-called marginal or de-

fense reserve facilities in order to meet customer demand. Some producers are operating at 100 pct or above. The national ingot rate may move to 95 pct during March.

The current market seems to be shifting from "tight" to "imbalance." Some consumers are paying premium prices for spot tonnages of cold-rolled sheets and enameling sheets. Next step could be a raid on warehouse stocks by consumers that normally buy from mills.

Some producers have already been approached by customers on the possibilities of conversion arrangements. But steel ingot and finishing capacity have been brought into such close balance that conversion space is more limited than was the case in previous tight markets. Result is that conversion won't be nearly as big a factor as it has been when the market tightened before.

Appliances:

Sales boom . . . Hotpoint runs \$5 million contest.

If Hotpoint, major Chicago producer of home appliances, is a case in point, the appliance industry is well away and running for the record year predicted earlier (See *THE IRON AGE*, Jan. 20).

With sales for the first 2 months of 1955 running ahead of 1954 figures by a 35-pct margin, Hotpoint is shooting for a total year production that will outstrip 1954's record output by 18 pct. With dealers' sales reflecting factory production in a period when dealers normally buy the new product lines to test their selling value, Hotpoint sales executives are understandably confident.

One more reason for their confidence: the announcement late last week that the appliance firm will sponsor a \$5 million national contest, involving the giveaway of four homes, 50 combination kitchen-laundries, and 5000 appliances.

Expected to trail along with Hotpoint's \$5 million outlay is another \$15 million from utilities. The campaign will feature electric appliances.

BARS: Steelmen See Record March

Producers report 10 to 15 pct higher bar shipments than last month . . . Expect to rise as much next month . . . Advance hits carbon, stainless alloy—both hot-rolled, cold-finished—By K. W. Bennett.

♦ HOW FAST is steel buying gaining? One sensitive indicator is steel bar, doubly so because the grade suffered more than most in the sharp steel buying cutback of first-half 1954.

Across the board last week, bar sellers were reporting 10 to 15 pct advances in tonnage shipments over January, and indicating the same amount of advance for January sales over December. Forecast for March—another 15 pct advance at least. Add them up and you'll have a record industry tonnage month in March.

An advance in the volume of bar shipments isn't news but the present rate of advance is. Bar shipments, in both cold-finished and hot-rolled, began inching up as early as August but a return to the old April-October peaks had been expected and bar producers weren't expressing much more than hope.

When October passed the gain continued.

By December's end it was apparent that the normal seasonal slump just wasn't coming. On the contrary, hot-rolled bar at the mill and cold-finished bar at the finisher level continued to gain strength.

All Types Up Now

With backlog and lead times advancing, cold-finished bar producers still speak with caution. One reason: last year was bad. Despite the slow gains of second half 1954, total shipments of cold-finished carbon bars for the year were only 58.6 pct of shipments in the year previous; cold-finished stainless bar made a better showing, averaged out at 68.6 pct of 1953 shipments. Alloy straggled at 51.7 pct of 1953 shipments.

Overall, cold-finished bar shipments were 55.1 pct of the 1953 figure; hot-rolled bar did better and captured 67 pct of the 1953 business level.

Current strength is across the product line. Stainless, alloy, carbon bar in both hot-rolled and cold-finished appear to be sharing in the gain, and the list includes tool steel.

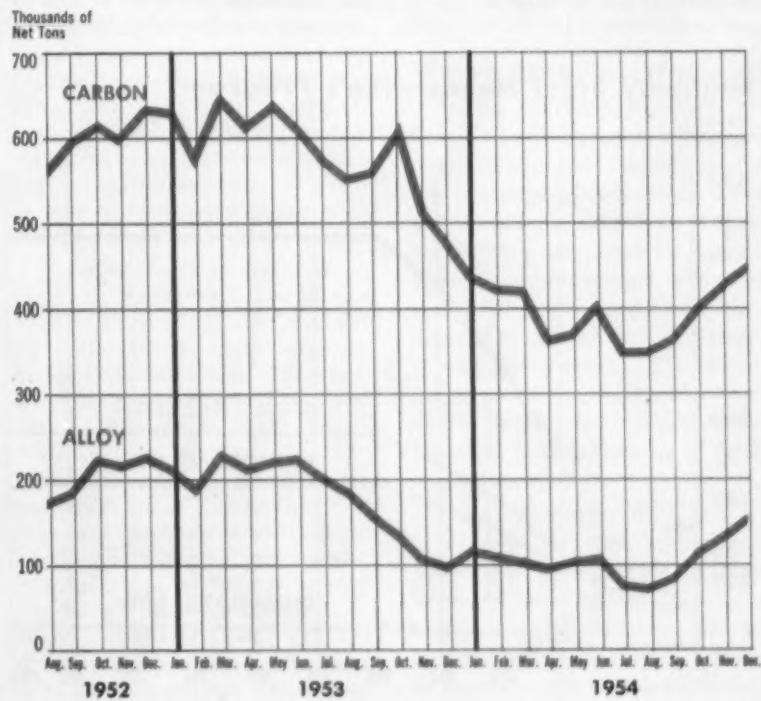
Bar men count their blessings but are keeping a jittery eye on inventories (see p. 75). There is little evidence of inventory buildup in bar—most consumers have regarded it as one of their most easily obtainable items. There is a tendency to move ordering time out, however. One producer has

been requested to grant booking space for third quarter delivery, a period when most bar men expect a considerable decline from present levels as the automotive industry makes its changeover.

Bar Man Talks

Spokesman at the distribution end for a bar producing mill was one of the scattered optimists who are sounding a strong note for immediate future prospects in the industry. His sales area, at its present rate of increase, will hit an alltime high in March bar sales. After March, he looks for a mild decline through June, followed by a normal third quarter fall-off.

Steel Bar Shipments Making Comeback



Source: American Iron & Steel Institute.

ROADS: Congress Ike's Biggest Hurdle

Most people agree the President's highway plan is needed . . .
 But they don't agree on financing . . . Industry wants to know how to get a
 share of the business . . . No serious shortages—By T. M. Rohan.

♦ REACTION of the U. S. roadbuilding industry and its suppliers to President Eisenhower's 10-year \$101 billion roadbuilding program is not "can we do it?" but "how can we get our share of the business?"

Need for the program, if not already obvious to anyone stuck in a traffic jam, was shown by the President's statistics, submitted to Congress last week in a message accompanying the bill. They were:

- (1) 36,000 dead annually in highway accidents, 1 million injured. Measurable economic cost of annual death toll is \$4.3 billion.
- (2) \$5 billion annual increased travel and transportation costs or about one extra cent per mile of vehicle travel due to poor roads.
- (3) Evacuation of target areas in event of atomic attack.
- (4) Estimated 180 million popu-

lation in 1965 and "existing traffic jams only faintly foreshadow those of 10 years hence."

President Favors Bonds

Major immediate obstacle to the program will be getting it through Congress where Democrats had already condemned it before it was received. President Eisenhower in his address last week left the door open somewhat on the most controversial feature—financing—with the following:

"A sound federal highway program, I believe, can and should stand on its own feet, with highway users providing the total dollars necessary for improvement and new construction. Financing of interstate and federal-aid systems should be based on the planned use of increasing revenues from present gas and diesel oil taxes, aug-

mented in limited instances with tolls.

"I am inclined to the view that it is sounder to finance this program by special bond issues, to be paid off by the above mentioned revenues which will be collected during the useful life of the roads and pledged to this purpose, rather than by an increase in general revenue obligations."

Sen. Gore (D., Tenn.), chairman of the public roads subcommittee, has already introduced a bill which would increase the federal share from \$875 million annually to \$1.6 million. Others opposing the President's financing are Sen. Harry F. Byrd (D., Va.) and Sen. Dennis Chavez (D., N. Mex.). The American Automobile Assn. has also come out strongly against additional toll roads.

Industry Can Do It

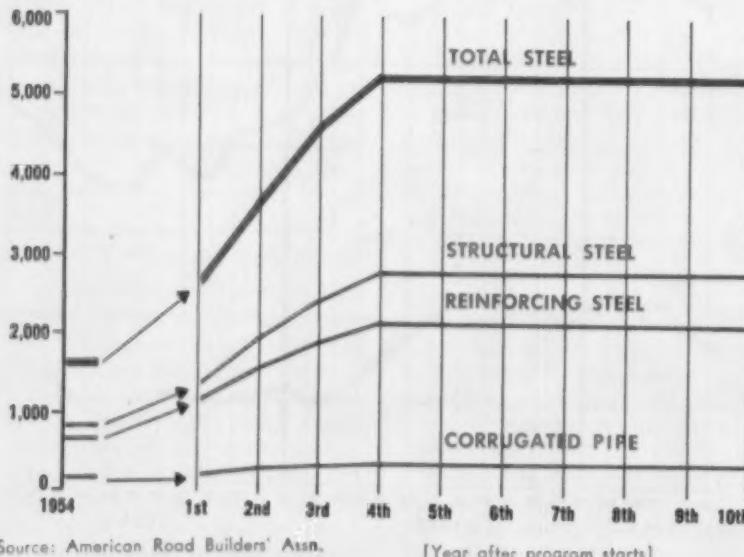
The President's proposal encompassed recommendations by an advisory committee headed by Gen. Lucius D. Clay published in January which urged the government increase its share to about 30 pct or \$31.225 billion over 10 years.

In all but a few phases, crucial though they are, the greatly expanded construction industry and its suppliers have the facilities to implement the program. Most pressing problems, aside from financing, are the shortage of engineers, regional shortages of cement and, in the steel industry, some pinch in wide-flange beams and possibly wire mesh to meet such a heavy demand.

Hal G. Sours, Columbus, O., consulting engineer and chairman of the American Roadbuilders Assn. task force on planning and design, told THE IRON AGE last week that for years there has been a decline

Highway Steel Needs—Ike's Program

Thousands of tons



Source: American Road Builders' Assn.

[Year after program starts]

in the number of engineers going into highway work and the situation is worsening.

Major problem is salary and, although starting rates have been increased, the middle and upper brackets still are in need of adjustment. A program such as this, added to the existing backlog, would further lengthen "lead" time into more years, he said. Competent consulting engineers are already starting to carry an increasing share of the load for state highway departments, Corps of Engineers and others, he said, even at the construction supervisory level. The Ohio turnpike currently being built is a prime example of this.

Expand Cement Capacity

Present staffs, he said, could handle the load by "enlarging from the bottom" with new men under experienced supervision. Under the envisioned program at least 300,000 bridges of various sizes would be built by the federal, state and local agencies.

In the cement industry there are currently several regional cement shortages but announced expansion plans plus additional fast amortization incentives will raise capacity significantly by 1959.

The steel industry is probably the best prepared at present to handle the increased demands of such a monumental roadbuilding program.

Republic's president, Chas. M. White, told a Washington audience recently, "Highway construction will absorb approximately 2.2 million tons of steel in 1955. The President's plan would increase annual highway steel requirements to about 5.5 million. This however amounts to only about 6 pct of the industry's production potential which may be increased during the next decade.

"Our study of the roadbuilding program . . . shows clearly that the steel industry has ample capacity to meet all the requirements that might develop. There is no problem regarding the production of reinforcing bars. Structural shapes and reinforcing mesh also appear to be in adequate supply."

Highway construction consump-



WELDED WIRE fabric like that shown above is being used in about 68 pct of all highway mileage. New program could double tonnage.

tion of wide-flange beams in 1954 was about 368,000 tons, according to the American Roadbuilders Assn. Their current estimates (considered liberal by several other groups) of the first year's additional use under the President's program would be 251,000 tons or a total of 619,000 tons. By the fourth year it would amount to 878,000 tons extra plus the current "normal" of 368,000 tons or a grand total of 1.24 million tons for highway alone. Current demand remains high for building construction especially and current delivery times being quoted by mills are 4 to 6 weeks.

Wide-flange beam capacity in the U. S. is currently limited to a handful of producers with about 2.2 million tons annual capacity under favorable product mix conditions. Producers are U. S. Steel Corp., Bethlehem Steel Corp., Phoenix Iron & Steel Co., and Kaiser Steel Corp. In addition, Inland Steel Co. at Chicago late this year will complete a \$15 million overhaul of a 28-in. structural mill to turn out up to 325,000 tons of 8 to 24-in. wide-flange beams. U. S. Steel's neighboring South Chicago Works specializes in heavier size to 36 in. with 587,000 tons annual capacity on its 52-in. mill.

Welded wire fabric producers' big job will be to convince highway engineers to use reinforced concrete roadways. If this is accomplished, consumption could be doubled for the industry. About 68 pct of all highway mileage being laid down in concrete currently is using wire fabric reinforcement.

Turn Page

Where Spending Would Be

As the President described the Clay Committee proposals the funds would be distributed as follows: For the interstate system, which would get top priority, \$25 billion; federal-aid primary and secondary roads, \$5.25 billion; federal-aid urban system, \$750 million; and forest highways, \$225 million.

Total thus reached is \$31.225 billion in national government outlays, about 30 pct of a recommended \$101 billion expenditure by all levels of government.

Construction potentialities will not be confined to roads, bridges, and feeder links. As the highways themselves are improved, there will be a bigger need for more roadside restaurants, motels, and service centers to accommodate a growing number of motorists.

If all concrete roads being installed under current programs used wire fabric reinforcement, consumption would be an additional 500,000 tons per year, according to authorities.

In the roadbuilding field, Ray Armington, general manager of GM's Euclid Div. at Cleveland, told THE IRON AGE last week the industry is currently running at "something less than 75 pct" and the business "can't possibly increase to an overload situation. When we see a few orders laid on the line, we'll start worrying," he said. He added there has been a decided upward trend this year and first quarter volume of orders is running about 20 pct over the period a year ago.

Steel for highways is generally divided tonnagewise into about 46 pct structurals, channels and formed plate; 42 pct reinforcing bars and welded wire fabric; 9 pct in corrugated drainage culverts and 2 pct in guard rails, special curbings, dowel units and key ways. Last year's total consumption for roadbuilding was about 1.5 million tons and estimates this year are about 1.8 million. Between 420 and 450 tons of steel are required for every \$1 million spent on highway construction or \$100,000 worth per construction mile. Almost 10 million tons of blast furnace slag are also used annually in highway construction.

Sixes Not Dead

In spite of the tendency to write off the old 6-cylinder engine, William J. Bird, vice president in charge of sales of Plymouth, predicts that more than a million sixes will be produced this year.

The main reason is the price tag, which runs about \$100 less than a V-8 among the manufacturers of both types of engines. Biggest dual producers are Plymouth, Chevrolet, and Ford among the Big Three.

In addition to the economy factor, Mr. Bird points out that they are building "longer life" into a 6-cylinder engine. In some taxicab fleets, which constitute the biggest market for sixes, major engine repairs are not required for 125,000 miles, with the help of exceptional preventive maintenance.

MAINTENANCE

Pipelines: Cleaning devices take rugged punishment.

Ever wonder what sort of "pipeline cleaner" is used on big oil and gas lines? Pipeline operators call it a "pig" or "go-devil." Essentially it's a three-element mechanical device consisting of a cylindrical body, spring-mounted stiff wire brushes and flexible synthetic rubber cups.

In operation the flexible cups seal against the inside of the pipe and the fluid pressure of whatever is flowing in the line drives the pig along. The brushes, of course, do their job on the pipe walls, removing sediment, dust, light scale as in the case of natural gas lines, or even hard wax from crude oil lines.

Service conditions are quite varied—and rugged. In some cases the pigs actually push tons of muck in front of them. In other cases the pigs zip along at speeds up to 100 mph—getting jolted by a weld bead every 40 ft. So the pigs have to be tough, too.

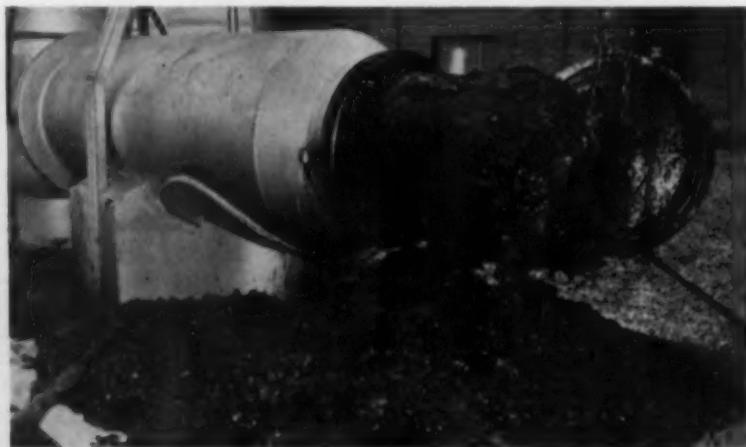
A stalled pig would be just as bad as a line clogged with dirt. It costs thousands to shut down a line to recover a stalled pig.

At the same time, the pig must be easy to disassemble for cleanup after each muck-raking trip.

T. D. Williamson, Inc., of Tulsa, builder of these pigs, uses a bolted assembly. Severe vibration encountered and the danger to pumping equipment that would be presented by possible loose fasteners in the pipeline dictated a locknut of some type. The firm finally settled on Elastic Stop nuts which employ non-metallic inserts to provide high frictional force. Byproduct advantages include: use of standard tools, complete reusability and no separate locking elements to get lost or improperly applied.



CLEAN PIG as it looks before running through a pipeline.



AFTER PIG has done its job you can't even see it under the wax and dirt it scraped from this large diameter oil line.

INTERNATIONAL

REDS: Lift Curtain to Export Autos

Estimate Communist countries will export 40,000 cars to West in 1955 . . . Last year's quota was only 7300 . . . West Germans cut prices to meet competition . . . Cars are slow but ruggedly built.

• RUSSIAN auto exports for 1955 are shrouded in typical Iron Curtain mystery. Some intelligent guesses have reached as high as 40,000 vehicles. Stumbling blocks in estimating probable number and destination are the political considerations which govern the Soviet's merchandising policies, directing the flow of goods now to the West, now to satellites, with prices regulated by the Soviet's need to undercut the current competition.

Last year Russia exported approximately 7300 autos, mainly to Finland, Sweden, Belgium, Luxembourg, Indonesia and Switzerland. These export cars were all of one model, the Moskovich—a four-passenger copy of General Motor's light, German-built Opel Cadett. The Moskovich could be formidable competition this year. Its offered in Western Europe at \$781, and uses widely distributed Opel parts.

Sell Luxury Models

Other Red cars in export markets for the first time this year include ZIM, Zis and Pobeda. The first two are heavy luxury models which heretofore would have been impossible to export successfully because of their high price. Now however, prices on these two have been shaved 5 to 8 pct below the delivered Western Europe price of a Cadillac. An export model of the Pobeda is being offered for the first time. This car is quite similar to the popular, low-medium priced French Renault.

In addition, a general purpose vehicle the GSFS, which is much like the U. S. Jeep, is being offered with emphasis on extreme economy and durability.

Russian truck production is very high compared with strictly pas-

senger car output. Last year's total truck production has been estimated at about 250,000. However, the entire output was kept behind the Iron Curtain.

Czech Production Up

Among the Soviet satellite nations, Czechoslovakia is the only producer of motor vehicles. Czech output has climbed considerably in the past 3 years. Production of cars and trucks in 1951 totalled 9500. Last year it had risen 23,000, of which only about 400 units reached Free World markets. Export of motorcycles however, ran to about 4000.

Czech auto exports beyond the Iron Curtain are slated for a sharp increase during the current year, with about 3000 units to be shipped of a total production run of 35,000 from the country's two factories Skoda and Tatra.

The current boost in Red production and resulting increased

export quotas present a threat to West Germany's booming auto industry which may reach the magic production goal of 1 million cars and trucks this year.

Although production rates are soaring and order backlogs run from 2 to 3 months on some models, German automakers have cut their prices as much as 10 pct in some cases to meet potential Russian competition in European markets. Even further price cuts are rumored for later this spring.

Such price cutting isn't as ruinous for German manufacturers as it would be for their U. S. counterparts because West German autos have had very few expensive tool and die changes to amortize. The highly popular Volkswagen for example, has had only minor detail changes over the past 8 years.

Export Big Percentage

Exports are vital to West Germany's auto industry, which shipped 43.2 pct of its total car and truck production to foreign consumers in 1954. About 12 to 15 pct of total production went to Red-dominated countries.

Qualitywise, Russian and Czech autos measure up fairly well, although they have less horsepower per unit of weight, are slower, have fewer refinements and are considerably less comfortable to ride in. In the credit side however, they are more ruggedly built; designed with an eye to the rougher roads of Russia and Eastern Europe.

A recent purchase by a Belgian firm of 60 Russian Pobeda cars for use on the unpaved roads of the Belgian Congo illustrates the point. The same firm, however, bought lighter, faster, smoother riding British and German cars for use in Belgium.



"It's up to Cornbone to train his new helper."

DIECASTING: Looks for Boom in '55

Job shop diecasters expect to top \$400 million this year after dip to \$268 million in '54 . . . Auto use to zoom as '55 front ends use eight times as much zinc . . . Issue industry standards—By R. L. Hetschek.

• DIECASTERS tightened their belts a bit last year following record sales volume in 1953—but they're expecting to have to buy new, longer belts by the time 1955 tallies are all in the record book.

Job shop sales for 1954 totaled \$268 million compared to the \$320 million business they did in the previous year, according to American Die Casting Institute. But all the signs now point to a new all-time record this year—which the industry estimates will top \$400 million.

Tonnagewise, job shops shipped 146,000 tons of zinc diecastings in 1954 and captive shops added another 75,000 tons for a yearly total of 221,000 tons. This compares

with the following 1953 figures: job shop shipments, 172,000 tons; captive production, 84,000 tons; and total, 256,000 tons.

Aluminum total slipped from the record 118,125 tons in '53 to 111,500 tons last year. Of the 1953 total, job shops shipped 92,375 tons and captive shops added 25,750 tons. In 1954, the job shop shipments slipped to 84,000 tons while captive output rose to 27,500 tons. This latter increase can be attributed to the fact that automakers comprise a large portion of captive shops and there is a definite trend to automatic transmissions which are largely made of aluminum diecastings.

Last year's magnesium diecast-

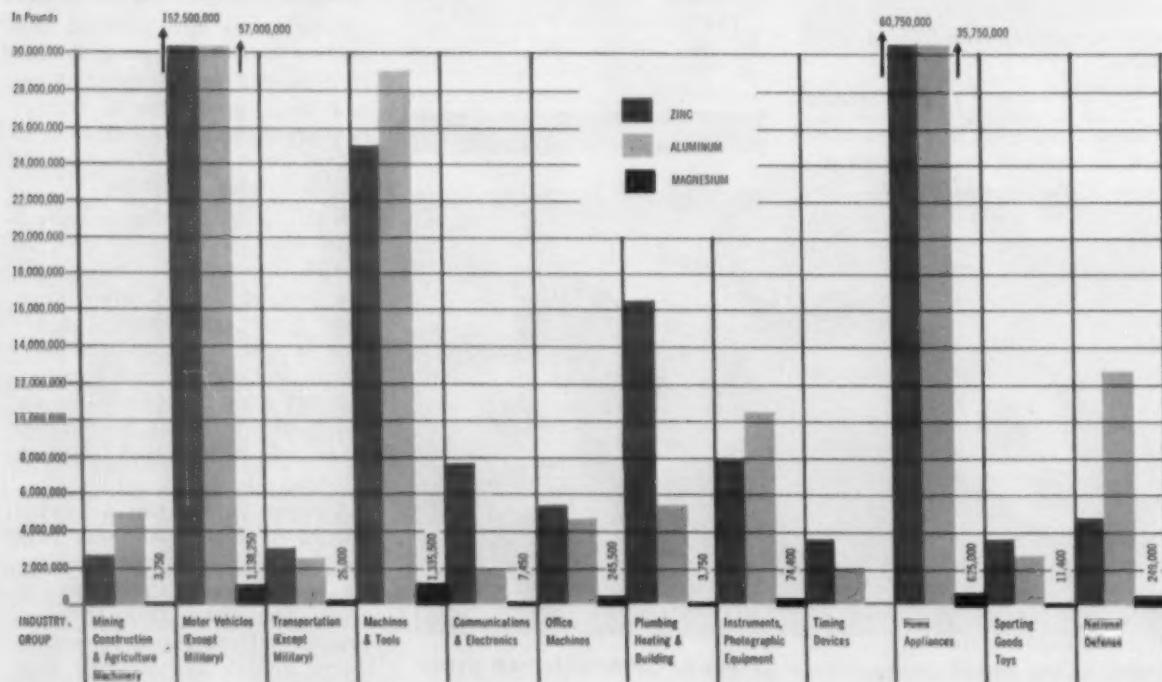
ing shipments, according to the Magnesium Assn., totaled 2414 tons as compared to 3057 tons in 1953. Of these totals, job shops shipped 1860 tons in '54 and 2158 tons in '53.

Consumption of copper base alloys for diecasting in 1954 breaks down as follows: job shop, 1893 tons; captive, 1408 tons; total, 3300 tons.

More Aluminum in Cars

As for end use distribution of job shop diecastings, all industry consumer groups used less zinc in 1954 than in 1953. Expressed as a percentage of total zinc diecastings shipped, however, the auto industry took 52.3 pct last year as against 48.1 pct in 1953. Home ap-

Who Buys Diecastings (1954)



Note: Totals represent all job shop sales. Source: Reports of members to American Die Casting Institute

pliances, second largest consumer, also increased the percentage, moving from 19.9 pct to 20.8 pct. A few others also registered slight gains percentagewise.

Aluminum, while the total job shop shipments declined, showed more variety from consumer to consumer. Actual tonnage increases were registered in automotive use (up 4550 tons); industrial and commercial machines, tools and equipment (up 3600 tons); and plumbing, heating and builders' hardware (up 550 tons). Appliance users, second largest aluminum diecasting market, and miscellaneous transportation rose in percent of total, but dipped in tonnage, as did all other consumers.

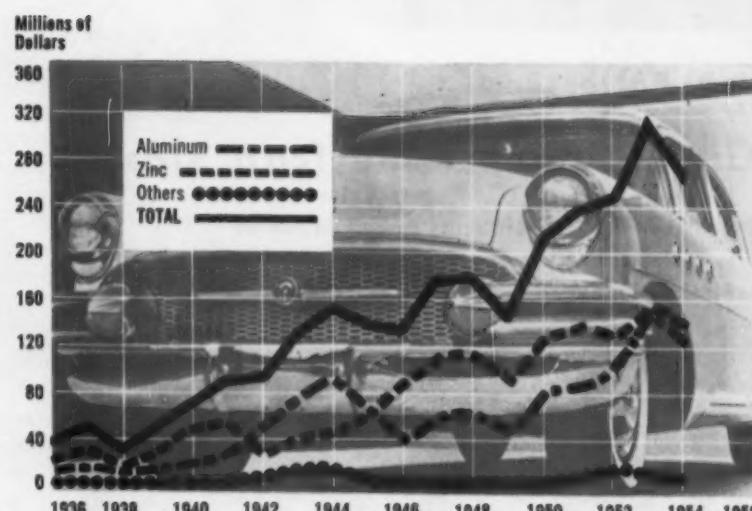
Job shop diecasters of magnesium did greater tonnage business in 1954 in mining, construction and agricultural equipment; in miscellaneous transportation; and in industrial and commercial equipment fields. Declining tonnages taken by other industries offset these gains to knock down the total.

In general, the overall decline in diecasting sales last year is attributed to the mild economic recession of the period which was felt more heavily in the metalworking industry and to the "stretch-out" of the defense program. These defense cutbacks hit job shop diecasters to the tune of 72 pct less zinc castings, 64 pct less aluminum castings and 55 pct less magnesium castings.

A major feature in compounding the job shop decline is that in boom 1953 many plants with captive shops could not handle their entire needs. When requirements slackened, of course, they tended wherever possible to stop buying rather than stop producing in their own shops.

But the industrial climate for 1955 is definitely better and diecasters are anticipating a new all-time record even if the entire economy does not rise above record 1953. Major factors behind the diecasters' prediction of a \$400 million year are two already-established trends: (1) greatly expanded use of zinc diecastings in 1955 auto front ends and (2) increased use of aluminum diecastings in civilian products.

Diecasting Sales Growth



Source: American Die Casting Institute.

A factor boosting magnesium, which does not compare tonnage-wise with zinc and aluminum, is the newly-developed hot-chamber machine for diecasting this ultralight metal. Not only does this type machine greatly increase production rates—it also contributes significantly to lowering unit costs.

Need 76 Million Handles

Since the automotive industry was already top user of zinc diecastings, taking more than half the total last year, the impressive swing to more zinc in the front ends of '55 models is really significant. According to ADCI, the new models use eight times as much zinc diecastings in front ends as the '54 cars did.

Of course, grilles and other front end decorations are not the only zinc diecastings used in automobiles. For instance, the auto industry will need 76 million diecast door and window handles this year.

Weight of zinc diecastings in '55 front ends, including grilles, insignia, moldings, headlight bezels and the like, varies from 3.50 lb to 39.93 lb on different makes and models.

As to increasing consumption of aluminum diecastings in civilian applications, automotive use for automatic transmissions is no doubt the largest—but it is far from the only one. There are defi-

nite trends to greater use in major home appliances and in office equipment as well as others mentioned above.

Sharply increased use of brass diecastings is sure to come about in the future.

The diecasting industry, through its institute, is also initiating a product standards program to help consumers economize and thus help boost diecasting sales. Diecasters have noted that many of their customers tend to overspecify, demanding more critical conditions than they actually require.

The standards present design values consistent with high speed uninterrupted production, reasonable tool and die life and maintenance cost, normal inspection, packing and shipping costs.

The first five of a series of standards were released early this week. They cover tolerances on linear dimensions, parting lines, moving die parts, flatness and draft requirement for walls.

Three more will be issued in July—depth of cored holes, draft requirements for cored holes and cored holes for tapping. Others, to be released when completed, cover diecast threads; fillets, ribs and corners; trimming; ejector pin marks; alignment; concentricity; machining stock allowances; and lettering, engraving and honeycomb designs.

J. R. Patterson

Gives South American Slant

Dollar shortages, credit limits curtail buying of U.S. equipment . . . Steel mill operators like our machinery but get easier terms from other countries.

Q. How are U. S. equipment manufacturers doing in South American markets?

A. They aren't faring too well. But—without exception—steel mill operators throughout the Southern Hemisphere appreciate the quality of machinery and equipment designed and built in the U. S. However, due to the shortage of dollars, they cannot purchase here unless they can arrange satisfactory credit terms. U. S. manufacturers have been selling on standard terms and in some cases granting extended payments up to 3 years. The German manufacturers of machinery and like equipment are offering 5 years and in some cases 6 years of progress payments.

Q. How can they improve in participation?

A.—The whole matter is a question of credit and terms.

Q. What is Mackintosh-Hemphill doing to improve its relations with South American industry?

A. Mackintosh-Hemphill Co. in some instances has taken steps to rectify as far as we are able the financing situation as it pertains to our firm. This can be done through bank credits, Export-Import Bank and other means.

Q. Which countries are principal competitors of U. S. industry?

A. Most of the heavy machinery in South America is coming from England and the Continent. Germany is the most aggressive in this respect. Another thing that amazed me was the tonnage of Japanese re-rolling billets being shipped to both east and west coasts of South America.

Q. How can we meet and overcome this competition?

A. We can overcome this competition through closer cooperation with our South American neighbors. We find them entirely honest in all of their business dealings. Closer sympathy and a better understanding of their difficulties will undoubtedly pay dividends and knit our respective continents closer together.

Q. Can the U. S. Government help U. S. industry? If so, how?

A. The government can help by a more generous credit policy. All funds loaned to individual companies in enabling them to finance their own requirements will be paid back faithfully.

ATCH COOPERATIVE

Export-Import Bank has extended a \$3.6 million line of credit to United Engineering and Foundry Co. to assist it in financing exports of rolling mills and equipment.

Under the arrangement, a foreign buyer of equipment would make a down payment of 20 pct; United Engineering would assume another 20 pct of the risk, and Export-Import Bank would buy 60 pct of the invoice value on a staggered payment basis.

Thus, United could make sales up to \$6 million since the credit covers 60 pct of the value of the goods sold. United emphasized it has not made any deals as yet but wants to have the credit available for future commitments.



J. R. Patterson, Mackintosh-Hemphill Co. vice-president just back from 2400-mile tour of South America.

Q. Is it likely that South America will eventually become a major outlet for U. S. capital goods?

A. I do not think there is any doubt about the fact that South America will eventually become a major outlet for U. S. capital goods. They are on the verge of the greatest wave of prosperity they have ever experienced. We can liken the various countries down there to our own country 100 years ago. They have all the raw materials necessary for all kinds of construction and manufacturing. They have the initiative, the engineering ability, the brains. They lack nothing but the ability to purchase here with U. S. dollars.

See Trade Act Passed

Despite plenty of opposition to lower tariffs, a majority of the Senate is prepared to endorse the House-passed version of President Eisenhower's reciprocal trade proposals.

There is certain to be opposition both in committee and on the Senate floor to some of the tariff-trimming powers in the trade bill. As was recommended by the Randall Commission in 1954, the President would be given authority to reduce selected tariffs by 15 pct at a rate of 5 pct per year.

Buying:

See danger to small firms in new procurement method.

Effects of present military procurement policies on small firms making aircraft parts will be the target of an investigation by a subcommittee of the House Small Business Committee.

The subcommittee, headed by Rep. Tom Steed, D., Okla., is disturbed by reports that aircraft parts industry is being damaged by the new "weapons system" of procurement.

Under this system, the military contracts only for end items, and prime contractors make their own arrangements for procuring components. In earlier systems, the military handled subcontracting as well as prime contracts.

Weapons system of procurement is having two results, Rep. Steed says: Prime contractors negotiate subcontracts "by private deals out of consideration of commercial strategy and cross-ties of financial interest" instead of by competitive bid, and when production schedules are curtailed, the prime contractors often begin making components themselves, throwing the subcontractor out of production.

"There is a serious question whether they (small aircraft component makers) will be killed off, not by any productive problems, but by the military's procurement and paperwork procedure," the chairman says.

H-Bomb:

See need for new plant dispersal policy

Today's industrial dispersal policies have been made obsolete by the H-bomb and should be replaced at once, Defense Mobilizer Arthur Flemming said in a recent appearance before a Senate Armed Services subcommittee.

Congress, said Mr. Flemming, should name a special Hoover-type commission capable of drawing a feasible, up-to-date dispersal blueprint and presenting its findings by May 15. Proposed commission might also suggest measures for protecting transportation systems,

schools and hospitals from H-bomb attack.

Obviously referring to the disclosure that an H-bomb blast can endanger life in a 7000-square-mile area, he stated that the policy of requiring new defense plants to be built at least 10 miles outside key target areas is outmoded.

He called for a new policy of dispersal guidance and indicated tax write-off benefits might be made contingent on cooperation. Policy would have to be sufficiently flexible to avoid economic disruption, he said.

Current official views on dispersals are opposed by Rep. James T. Patterson, R., Conn., a member of the Joint Committee on Atomic Energy. He urges underground plants and strengthened air defense in place of scattered facilities. He charges the official attitude has hurt New England states in their efforts to retain industries.

Let Radar Contract

Named by the Air Force as prime contractor for construction of the Distant Early Warning (DEW) line across northern Canada is Western Electric Co., Inc., manufacturing and supply unit of the Bell Telephone System.

Western Electric also was the contractor for a pilot warning system in the Barter Island area of Alaska.

DEFENSE

Purpose of the DEW line radar net is to detect enemy planes and give an immediate warning to defense command centers in Canada and the U. S. Both the U. S. and Canada are participating in the system, but the U. S. has responsibility for construction and installation tasks.

Three construction areas have been outlined. For the western section, the subcontractor is Puget Sound Bridge & Dredging Co., Johnson, Drake & Piper, Inc., of Seattle. Subcontractor for the central section is the Northern Construction and J. W. Stewart Co., Ltd., of Vancouver. For the eastern section, it is the Foundation Co. of Canada, Ltd., of Montreal.

Contracts Reported

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Drills, twist, high speed steel, type B class 1, 102276 ea., \$40,529, Continental Drill Corp., Chicago, Ill.

Generator-ac, stator-gen. elec. output, armature-rotor, etc., V, \$198,821, O'Keefe & Merritt Co., Los Angeles, Cal.

Launching pendant assembly; steel, F9F airplane, 1540 ea., \$57,367, American Chain & Cable Co., Inc., American Cable Div., Wilkes-Barre, Pa., *C. Fauset*.

Amplifier units, controller, directional gyros, spare parts, handbooks, \$2,000,418, General Electric Co., Schenectady, N. Y.

Pumps, centrifugal, portable, gasoline engine driven, 50 ea., \$82,934, Carver Pump Co., Muscatine, Iowa.



PORTRABLE DOCK for B-47 Stratojet bombers was developed by Luria Engineering Co., Bethlehem, Pa., to permit all-weather servicing of the Stratojets. Designed in five bolted sections, dock can be moved on dollies and is equipped with work platforms around wings. Structural steel framework of 100-ton dock is covered with corrugated galvanized steel.

EXPANSION IN INDUSTRY

Westinghouse:

Program doubles turbine production capacity.

Westinghouse Electric Corp. has completed its \$32 million Steam Div. plant expansion in South Philadelphia. New facilities more than double productive capacity for steam turbines and associated equipment. In addition to manufacturing and testing facilities, a \$6 million steam and gas-turbine research and development laboratory has been completed.

W. C. Rowland, Steam Div. vice-president and manager pointed out that since 1900 the electric utility industry has nearly doubled its generating capacity every 10 years. He added that continued industry growth has called for greatly increased production of generating apparatus both in number and sizes of units.

Division fabricating and welding

facilities have been increased 90 pct. Drop-forging shop and heavy machining operations have been upped by 50 pct. Cost of large and small machine tools acquired totals more than \$10 million. Larger machine tools include a 28-ft vertical boring mill, a 96-in. engine lathe and a 10-ft planer-mill.

Warehouse to Open

American Steel & Wire Div. of U. S. Steel Corp. is opening a warehouse in Massena, N. Y. to serve St. Lawrence Seaway contractors and construction companies. The 4,800 sq ft building will feature electrical wire and cable and wire rope products.

An 8,000 lb capacity hydraulic lift is a special truck loading feature. First stock shipment to the warehouse will include more than 110,000 ft of wire rope in 21 grades and sizes.

Facilities Planned

Washington Steel Corp. board of directors has approved plans for increasing company production facilities of stainless steel sheet and strip. Plans include installation of a 48-in Sendzimir cold rolling mill together with suitable collateral facilities.

Cost of the project is estimated at \$2.6 million. Stockholders will meet shortly to act on the board's proposal.

Opens Coast Branch

Oxy-Catalyst Inc. has opened its first branch office in Los Angeles. The Wayne, Pa., firm develops and manufactures catalytic devices for air pollution control and waste heat recovery.

For the past 4 years the firm has manufactured an oxidation catalyst which has been used in solvent processing, oil refining, food and other industries to eliminate stack pollutants. In some cases, the catalyst is used to generate usable heat energy from waste gases.

IRON & STEEL: January Output By Districts

As reported to the American Iron and Steel Institute

| DISTRICTS | Annual Capacity | January | PIG IRON | FERROMANG. & SPIEGEL | TOTAL | |
|-----------------------|-------------------|------------------|---------------|-------------------------|-------------|-----------------|
| | | | January | January | January | Pct of Capacity |
| Eastern | 17,456,180 | 1,132,817 | 25,001 | 1,157,878 | 78.1 | |
| Pittsburgh-Youngstown | 20,931,870 | 1,097,045 | 23,000 | 2,020,943 | 79.5 | |
| Cleveland-Detroit | 8,692,600 | 679,263 | | 470,263 | 82.4 | |
| Chicago | 10,431,050 | 1,220,167 | | 1,220,167 | 87.4 | |
| Southern | 8,419,000 | 615,088 | 6,290 | 431,376 | 79.1 | |
| Western | 4,040,000 | 278,234 | | 270,234 | 90.5 | |
| TOTAL | 83,971,180 | 5,729,404 | 55,249 | 5,784,653 | 81.1 | |

| DISTRICTS | Annual Capacity | January | TOTAL STEEL | | ALLOY STEEL | |
|-----------------------|--------------------|------------------|-----------------|--------------|----------------|--|
| | | | Pct of Capacity | Index | | |
| | | | | | | |
| Eastern | 26,437,000 | 1,814,440 | 88.8 | 130.8 | 112,225 | |
| Pittsburgh-Youngstown | 44,342,000 | 3,097,188 | 62.2 | 108.2 | 460,700 | |
| Cleveland-Detroit | 13,024,000 | 1,077,880 | 57.8 | 108.3 | 94,085 | |
| Chicago | 27,882,700 | 1,871,704 | 83.3 | 102.7 | 134,783 | |
| Southern | 7,063,420 | 462,238 | 76.7 | 122.8 | 5,700 | |
| Western | 7,000,470 | 624,292 | 87.8 | 120.4 | 12,498 | |
| TOTAL | 125,628,310 | 8,837,738 | 82.7 | 124.2 | 620,184 | |

Atom Plants for U.K.

An \$840 million nuclear power station building program has been drawn up by Britain. Present plans envisage construction of 12 nuclear stations in 10 years with a total capacity by 1965 of 1.5 to 2 million kw. This should save 5 to 6 million tons of coal.

Big Buildup for Inland

Inland Steel Co. is planning to make capital outlays of more than \$40 million this year—highest investment in the company's history.

Major new installations to be completed in 1955 include a 325,000 ton capacity wide-flange beam mill and a third continuous galvanizing line which will boost Inland's galvanized sheet production capacity by 60 pct.

We put Hydraulic Cylinders on a reducing diet



RESULT:

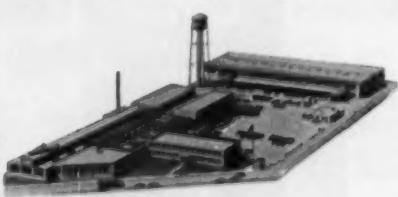
The New **VICKERS.**
"Compact"
HYDRAULIC CYLINDERS



Everybody agreed that hydraulic cylinders were just too fat . . . took up too much space. So our engineers put them on a reducing diet. The result . . . these slim, powerful, "Compact" cylinders fit and work in spaces where the old type could not. It is part of Vickers long-time program of continuous improvement.

Among their many other features are: Multiple port positions. Spring-loaded synthetic-impregnated leather rod seal compensates for wear, assures long service. Piston seals are improved cup type. Tie rods are high tensile alloy steel. Adjustable integral hydraulic cushions are available. Comply with JIC standards. Conservatively rated for maximum working pressure of 2,000 psi. For further information, see Bulletin 54-68.

Waterbury Tool Division of Vickers Incorporated where "Compact" Cylinders are manufactured.



Ask for New Bulletin 54-68

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DIVISION OF SPERRY CORPORATION
1420 OAKMAN BLVD. • DETROIT 32, MICH.

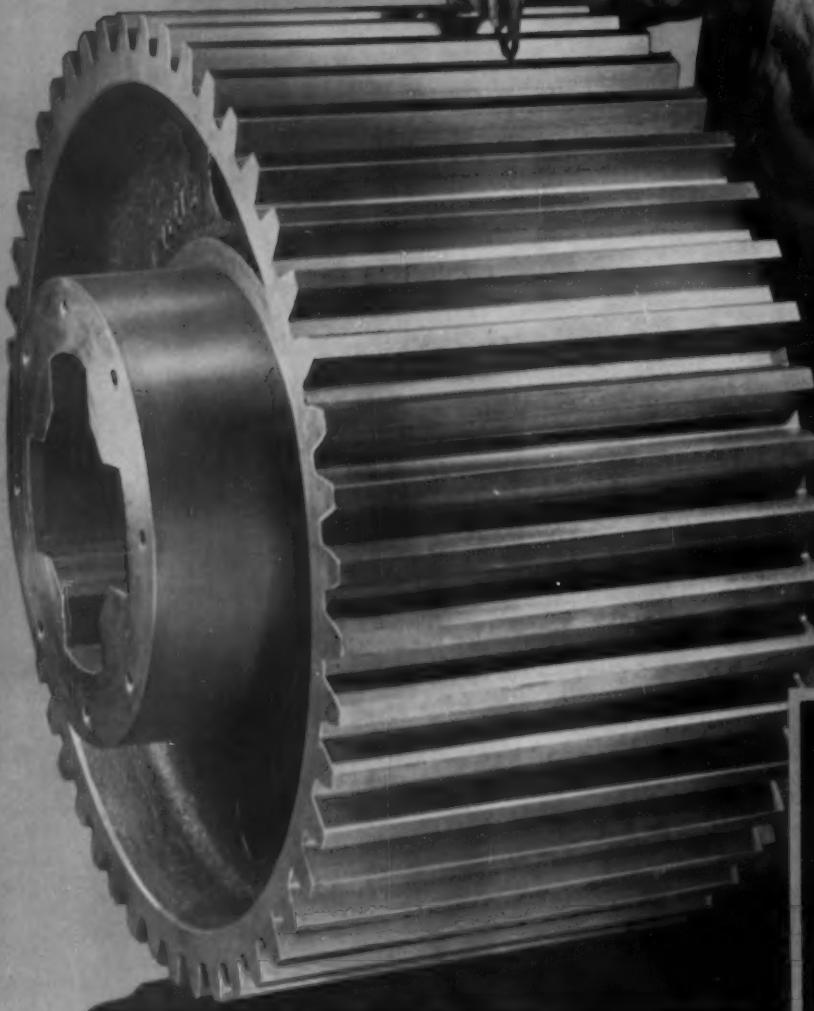
Application Engineering Offices: • ATLANTA • CHICAGO AREA (Brookfield) • CINCINNATI
CLEVELAND • DETROIT • HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS
NEW YORK AREA (Summit, N. J.) • PHILADELPHIA AREA (Media) • PITTSBURGH AREA
(Mt. Lebanon) • ROCHESTER • ROCKFORD • SAN FRANCISCO AREA (Berkeley) • SEATTLE
TULSA • WASHINGTON • WORCESTER

6950

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Some PINION!

by



Yes, it is "some Pinion" 54" diameter, 30" face width and weighing 4,600 lbs. . . . but it is just part of a day's work at "Phillie Gear."

Here in one of the World's largest and most modernly equipped gear plants are all the latest machines, methods and craftsmen necessary to produce accurate gears of any type, size and quantity.

When you require gears for any purpose, consult our Engineering Staff for courteous service and prompt action.

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Helical
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Sprockets
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work

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Industrial Gears & Speed Reducers

Limitorque Valve Controls

ESTABLISHED 1892

Report To Management

\$20 to Make Everybody Happy

You can't beat Santa Claus. That's the axiom the Democrats were working on in their drive for a \$20-per-person income tax cut. It was a flagrantly undisguised political maneuver designed to influence the voters in '56. It was also a case of the Democrats trying to get there with the bonbons first, since President Eisenhower indicated earlier the Republicans might put through an income tax reduction of their own next year.

If the move is politically wise, it's also fiscal folly as Republican leaders have correctly labeled it. Certainly this is no time for a tax cut. It only makes the virtually impossible chore of balancing the budget that much more unattainable, adds pressure to already existing inflationary forces, and won't improve the lot of individual taxpayers markedly.

It also weakens our stockpile of anti-recession weapons, since it will be that much harder to hypo the economy with another tax cut if we do go into a slump. A year ago when the Democrats went through the motions of urging a \$200 increase in personal income tax deductions there was some justification for it. The proposals were made when we were at the lowpoint of the recession and some government leaders honestly feared we were in a serious economic tailspin. Some thought a tax break was needed to help stimulate the economy.

But now business is uptrending vigorously. There's no need for a nudge so long as business continues its show of strength and consumers keep up their extremely high rate of spending.

Though the Democrats were responsible for the current tax cut drive, the Republicans' self-righteous cries of "irresponsibility" have a phony ring. It's known that the G. O. P. was planning to do the same thing next year—they have their eyes on the polls, too. So much of

the wailing from Republican ranks is sour grapes. They're afraid the Democrats may have stolen their election day thunder.

The nation is now seeing Congress at its worst. It's an unfortunate fact of life that politicians (of both parties) have to play politics—frequently at the expense of the nation's welfare. There's no justification for a tax cut now—the only hope is that wise heads will prevail.

Purchasing Agents Are Bullish

Purchasing agents are more optimistic than they have been for some time. Survey by National Assn. of Purchasing Agents on February business shows 55 pct indicating an increase in new orders—this is the greatest number reporting a gain since September 1950. Conversely the few (8 pct) who said production and new orders had fallen were extremely pessimistic—stating vociferously that business conditions for their company or for their area were not good.

Industrial buyers also say pressure on prices is mounting. More than half report prices are up, the largest number to report increases since February 1951. Setting the pace in the price climb are copper, aluminum and rubber.

Buying policy of purchasing agents is becoming less conservative: 76 pct are now in the hand-to-mouth 60-day range compared with around 95 pct in January.

Railroads Look Less Anemic

Railroads continue to show improvement. Through mid-February loading of revenue freight totaled 3,809,369 cars compared with 3,737,597 for the same period in 1954. And orders for new freight cars hit 5087 in January in contrast with 2685 in December 1954. Backlog of cars on order as of Feb. 1 amounted to 18,395 compared with 15,317 on Jan. 1.

INDUSTRIAL BRIEFS

District Added . . . Kaiser Aluminum & Chemical Sales, Inc., has established a new sales district with headquarters in St. Louis. This district is the fourteenth to be formed and was created from portions of the Kansas City, Chicago and Atlanta districts.

Milestone . . . Republic Steel Corp., recently produced its 150 millionth ton of steel at its Canton, Ohio, steel plant. Civic leaders, members of management and Republic customers from Stark County attended celebrations at the plant, and later a luncheon.

Pulled up Stakes . . . Lewis-Shepard Prod., Inc., have moved to new and larger quarters in the New York-North Jersey area. The company is now located at 3730 Tonnelle Ave., N. Bergen, N. J.

New Facilities . . . Applied Research Laboratories, Montrose, Calif., completed facilities for the design and production of X-ray and gamma ray optical elements and instruments. These will be produced on a special products basis and built to order.

A First . . . The American Institute of Mining & Metallurgical Engineers announced that the first winner of the Benjamin Fairless Award was Mr. Stewart Joseph Cort, vice-president-steel division and director of Bethlehem Steel Co. The citation commends Mr. Cort for his leadership in iron and steel manufacturing.

New Moniker . . . Honan-Crane Corp., Lebanon, Ind., has been changed to Houdaille-Hershey of Indiana, Inc. Formation of this corporation marks the first step in plan of Houdaille-Hershey (parent company) to establish a filtration division at Lebanon.

New Prexy . . . James J. Nance was elected president of the Automobile Manufacturers Assn. Mr. Nance is the president of Studebaker-Packard Corp.

Peak Production . . . The recently completed plant of DeVlieg Microbore Co., located in Royal Oak, Mich., has gone into full production.

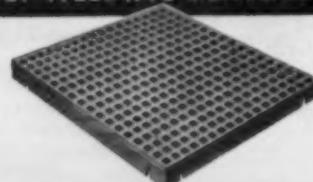
Decided Not To . . . A. M. Byers Co., and Erie Forge & Steel Corp., have decided against a proposed merger between the two companies.

Licensing Agreement . . . Baldwin-Lima-Hamilton Corp., Philadelphia, recently announced a cross-licensing agreement with Carl Schenck, Darmstadt, Germany.

In Recognition . . . George H. Deike received the Erskine Ramsay Gold Medal Award, at the annual meeting of the American Institute of Mining & Metallurgical Engineers, in Chicago recently. Mr. Deike is board chairman of Mine Safety Appliances Co. Pittsburgh.

Attention . . . Jarvis Corp., Middletown, Conn., is the new name of the former Charles L. Jarvis Co.

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O'FALLON 4, ILLINOIS



The bumper mount and the 3-legged stool

**A case history of interest
to any manufacturer who uses
flat-rolled steel.**

A little piece of steel like that shown above serves as an automobile bumper mount. Originally, this mount was to be projection-welded to the bumper at each of four points. But during the welding process, at the supplying manufacturer's plant, one point of the mount either refused to take the weld, or it broke easily under strain.

Time was running out. Production lagged and costs skyrocketed. And then a Great Lakes Steel Technical Service Representative was called in. He discovered that, regardless of how flat the rectangular mounting might be, it was virtually impossible to get a strong projection weld at all four corners. But when he eliminated one weld, the plate snuggled into the bumper and made perfect contact on three points—just like a three-legged stool! Three welds were actually stronger than four.

Solving problems is a tradition at Great Lakes Steel. As specialists in flat-rolled products, Great Lakes has had to come up with the right answers to problems in many fields. It will pay you to take advantage of this reservoir of experience next time you have a problem that concerns flat-rolled steel.

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Ecorse, Detroit 29, Mich. • A Unit of

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SALES OFFICES IN BOSTON, CHICAGO, CINCINNATI, CLEVELAND, HOUSTON, INDIANAPOLIS, LANSING, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, ROCHESTER, ST. LOUIS, SAN FRANCISCO AND TORONTO



V-8 Plant Has Built-In Safety Factor

New Chevrolet engine plant is automated—but is backed up by shunt lines of conventional tools . . . If breakdown hits complex line, partly machined blocks go down by-pass line—By R. D. Raddant.

• WELL OVER a year ago, when Chevrolet started to tool up for its new V-8, it became apparent that this biggest of all automotive divisions would not rely on the extremes of automation that Ford had applied to its engine tooling.

Tooling experts reported that Chevrolet engineers, fearing costly downtime that could be disastrous at the division's high production rates, were planning safeguards that would be a modification of extreme automation with conventional tooling.

Combined Operation . . . The result is called "segmented automation" at Chevrolet's new engine plant at Flint. It is a combination of the highly publicized block and head broaching, push-button machining, and other automation devices, backed up by banks of parts. Most important are by-pass lines of conventional machining which constitute the safety factor.

In case of a breakdown of any of the complex automated equipment, large banks of partly ma-

chined blocks can be brought to bear and by-pass lines of conventional machines can be brought into use until repair is completed.

At Ford, automatic shuttle devices automatically cut off production on one line in case of trouble or routine tool change in preventive maintenance, send the production to one of the parallel lines.

Lines Paired . . . When in full operation, Chevrolet's new engine plant near Flint will turn out its Turbo-Fire V-8's on four automated U shaped engine block lines, each over 1100 ft long. It will also have six automated cylinder head lines and two final assembly lines. These parallel lines provide another safeguard in that unfinished blocks and heads can be shifted from one line to another in case of trouble along one line.

An outstanding feature of the engine line is the huge broach that broaches the bottom of the block and two cylinder faces in two operations. Following broaching, there are nine transfer machines

with 121 stations, and a total of 550 spindles performing individual operations on the block. The 1 million sq ft plant is the largest single unit of Chevrolet's 5½ million sq ft expansion program.

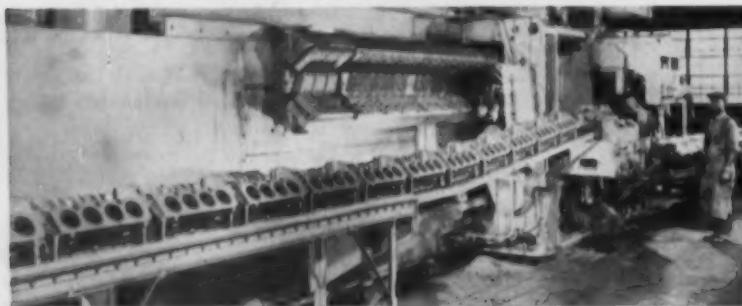
Balanced Electrically . . . Chevrolet has utilized an entirely new electronic balancing machine to produce the smooth running characteristics of the engine. Chevy drum-beaters say a nickel can be balanced on edge on its surface while the shaft turns 2500 rpm.

The new balancing machine holds engine balance within 0.5 in.-oz. The two major parts of the dynamic balancing machines are an electronic brain and a drill that cuts into counterweights forged onto either end of the crankshaft.

The "brain" records the overall imbalance of the engine by measuring its wiggle at 700 rpm. It simultaneously adjusts the drill to the depth required to offset the imbalance.

In conventional production, four rotating parts, crankshaft, clutch, flywheel and harmonic balancer were balanced individually within specified limits. In effect, this new method balances the engine as a unit after the parts have been balanced individually. Drilling the counterweights offsets imbalance in the individual parts because the accumulated imbalance always shows up in the crankshaft carrying the weights.

More Torsion Bars Coming . . . Many auto executives, while publicly discounting it, are privately admitting that Packard stole a march on the industry with its



BLOCKS MOVE down Chevrolet automated production line after first machining operation. Broaching machine shaves three faces, replacing nine milling machines. Line is back-stopped by conventional tools.



Here's a bolt whose weakness is its strength!

Making a bolt that fails precisely when it should requires specialized manufacturing skills.

This is the job New Holland Machine Company, farm equipment manufacturers, turned over to RB&W. The bolt is used on the flywheel of a New Holland baler. "Critical" is a weak word for its importance to the baler.

If the baler picks up a foreign object such as a rock or stone, this bolt *must* snap to prevent gear breakage. But it can't fail too soon—when the baler eats up extra-heavy windrows, for example. If it failed every time this happened, the farmer would spend all day replacing bolts—instead of making hay.

RB&W worked hand-in-glove with New Holland engineers in the tough job of heat-treating a standard machine bolt to these exacting specifications. It took a lot of ingenuity—but paid off. You can expect the same kind of service, cooperation and end product when you drop your fastener problem in our hopper. RUSSELL, BURDSALL & WARD BOLT AND NUT CO., Port Chester, N.Y.



UP TO TWELVE TONS OF HAY AN HOUR is the capacity of New Holland's Super 77 power take-off baler. With every minute vital in harvesting, farmers can't take

chances on machinery failure—so New Holland built rugged parts into the Super 77, gave it extra-large capacity for fast, reliable operation.

RB&W

RUSSELL, BURDSALL & WARD

110 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. Additional sales offices at: ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. Sales agents at: NEW ORLEANS, DENVER, SEATTLE. Distributors from coast to coast.



★ ★ ★ ★ ★ Such prominent
firms manufacture fine prod-
ucts... and require well-
made component parts. You,
too, can be sure of quality
deep drawn stampings when
you specify



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ALLIANCE, OHIO
Designers and Makers of
Deep Drawn Stampings

Sales Offices: NEW YORK, DETROIT,
CHICAGO, CLEVELAND, PHILADELPHIA,
INDIANAPOLIS



Automotive Production

(U. S. and Canada Combined)

| WEEK ENDING | CARS | TRUCKS |
|---------------|---------|--------|
| Feb. 26, 1955 | 176,010 | 15,813 |
| Feb. 19, 1955 | 180,914 | 15,730 |
| Feb. 27, 1954 | 122,222 | 23,758 |
| Feb. 20, 1954 | 123,005 | 25,252 |

*Estimated. Source: Ward's Reports

torsion bar suspension, both in engineering and market promotion.

The sales manager of a leading auto producer confided to this column that his own division as well as a large part of the industry would have a torsion bar suspension within 3 years. Some competitors contend that Packard's present system is costly to make and install and may not be the system that would lend itself to universal adoption.

However, Packard spokesmen say it is not prohibitive in cost, has little or no maintenance problem. That it has attracted only favorable interest is a conclusion that is generally accepted.

As a comparatively small manufacturer in these days of giants, Packard is faced with the problem of gaining universal acceptance. Auto merchandisers believe that Packard made a brave and smart move in concentrating on a new idea of riding comfort while the rest of the industry continued to develop the sex appeal of horsepower. At the same time, Packard with top horsepower (except for the Chrysler 300) had that appeal plus the new angle of the torsion level ride.

In terms of publicity, it has already paid off. Meanwhile, it continues to pick up a few valuable awards here and there.

Sales:

Predicts 33-pct boost in first quarter buying.

A top Ford economist estimates that retail sales of passenger cars in the first quarter of 1955 will exceed sales in the same period last year by 33 pct and for 1953 by 20 pct.

George P. Hitchings, manager of Ford's economic analysis department, concedes that part of current production of cars is required

to build up dealer stocks. But he points out that "customers are buying cars in unprecedented quantities for this time of year."

He cites the steel industry and residential construction as leaders with the auto industry in the upsurge of business activity. However, he cautioned that "these segments of the economy are not likely to rise still further."

In Mr. Hitchings opinion, "seasonal influence and loss of inventory build-up as a source of demand will undoubtedly bring about some contraction in production of autos and steel in the second half of 1955."

Imports:

Metropolitan called top foreign built seller.

The Metropolitan, engineered by American Motors in this country but produced in England, has become the top seller of all foreign-built cars sold in the U. S.

According to W. S. Berry, chief mechanical automotive engineer of American Motors, the Metropolitan accounted for 19.3 pct of all foreign car registrations in the first 11 months of 1954.

AUTOMOTIVE NEWS

While not giving total sales, the Volkswagen was second with 16 pct; Jaguar next with 10 pct; MG, 9.15 pct; Hillman, 7.2 pct; Austin-Healy, 5.9 pct; Ford, 4.7 pct, and Austin, 4.3 pct.

Buyers Like Economy

American Motors research questionnaires indicated that purchasers liked its economy as the Metropolitan's most attractive feature. Forty-five pct of Metropolitan purchasers said they bought the Metropolitan for commuting, while 23 pct said they bought the car for shopping.

These survey results were in line with the American's theory that there is a solid market for a small car, primarily as a second family car. To avoid high U. S. tooling costs, the company decided to build the car abroad. Fisher & Ludlow, Ltd., Birmingham, England, was contracted to do the body work. The powerplant was selected from Austin's production units, a 42-hp engine.

THE BULL OF THE WOODS

By J. R. Williams



announcing

**America's
first and only
rubber-tired
diesel electric
cranes**

electric travel, electric rotation!
25 to 60 ton capacities!



Designed and built by Industrial Brownhoist Corporation for mines, quarries, railroads, steel mills, the lumber industry and other large manufacturing plants that require mobile materials handling equipment in heavy duty capacities, America's first Diesel Electric Wagon Crane is now in production. Available in capacities from 25 to 60 tons, the new wagon crane will be equipped with dynamic clutch, anti-friction bearings at essential points, and power steering. It employs electric travel and electric rotation. Mounted on a 12-wheel crane carrier capable of speeds up to 8 miles per hour, the unit can be operated by one man from easy-to-reach crane and carrier controls. Rigorous tests indicate that the new machine provides economical operation and insures added savings of time and labor in heavy duty materials handling work. For complete details, consult a Brownhoist representative or write us today.

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BROWNHOIST



GAW Talk Flies Fast in Capital

Administration officials claim management has accepted "principle" of guaranteed wage . . . Unions may get modified form . . . Drive on steel industry seen following auto settlement—By G. H. Baker.

♦ AS Eisenhower Administration officials see it, the principle of guaranteed annual wages has now been accepted by top management in the auto industry. From here on, it's only a matter of agreeing to the shape, form, and size of the plan to be put into effect in Detroit this year. These same officials say:

"As soon as it becomes publicly known that the auto industry has agreed to a guaranteed wage plan, Walter Reuther and the CIO will train their 'educational' fire on steel. Administration labor-management experts believe the steel industry will be forced into line by next year, at the latest."

These officials believe that the days when top management could "look the other way, and maybe it will all blow over" are gone. The rank-and-file of United Auto Workers (CIO) members now demand a GAW plan as an "employment right."

Won't Cover All . . . Whether or not the UAW wins a full-blown GAW this year is something else again. What you can most likely expect to result from the labor-management talks now under way is a modified GAW plan that will permit both sides to save face, according to administration officials.

According to congressional sources, the "entering wedge" plan to be adopted this year will apply only to employees with a certain degree of seniority—say 10 years, or possibly 20 years. Workers with less service would not now be affected by the GAW. Idea is that

in succeeding years, the cut-off point would be trimmed to 9 years or 19 years, as the case may be, and eventually worked down so that all employees with more than one year's service would be covered.

Foot In Door . . . "Once you accept the principle of a guaranteed wage—once you permit the camel to get his nose under the tent—it's only a matter of increasing the scope of the plan each year," one top official says in commenting on the plan.

There is much less talk in congressional circles now over the threat of an auto strike than there was earlier this year. Interested congressmen note that Detroit production is booming (better than 40 pct ahead of 1954), and so are retail sales. There are no large accumulations of inventories, no fat that would permit the industry to ride out a strike. The industry is selling virtually every car it turns out.

Probe Not Likely . . . Walter Reuther's demand for a full-scale congressional investigation of automation isn't likely to rate any serious consideration at the Capitol this spring, but if unemployment should rise after the mid-year point you can expect a big pow-wow on the subject.

Mr. Reuther contends the United States needs from 2.5 million to 3.5 million new jobs every year to offset the spread of automation and technological advances. Thus far, this many new jobs aren't materializing. As a

result, we're headed for a depression, mass unemployment, and widespread loss of purchasing power, he claims.

A congressional probe, as requested by Mr. Reuther, would provide the "planned economy" advocates with an excellent chance to air their argument that the federal government must assume new authority in the area of industrial planning. To increase consumer demand, to obtain a healthy rate of economic growth, the government must take steps to prevent any large displacement of workers, it is contended. Inevitably, this group believes, the government—not private industry—must take charge of broad employment and production policies.

Would Mean Raises . . . Base pay of some 1.3 million workers would be increased by \$230 million a year — 9¢ an hour average—if the proposal to raise the min-

"There is no question in our minds that we will establish a guaranteed annual employment program in our industry," the *United Automobile Worker* quotes UAW-CIO president Walter Reuther as saying before the New York Economic Club recently.

"Two of the purposes of this program are to put more purchasing power into the hands of people who need it and who will use it as consumers . . . and to provide management with an incentive to rationalize their production over a year," he added.

4 ways this new inspection tool may help you



Reduce Product Costs. By eliminating the factor of over-design, a betatron helped one manufacturer. The result was a product far less costly to manufacture. Weight reductions made it easier to install, too.

Save on Raw Material. In less than six months a betatron paid for itself through raw material savings. One example: A simple two-piece welded part could replace a complicated casting because the speed and depth of penetration of a betatron permitted thorough inspection of the weld.

Convert Rejects Into Usable Products. Here's how a betatron helped another manufacturer: by helping to locate flaws exactly, many rejects could be repaired instead of discarded. In addition, by discovering flaws before machining, betatrons can save machine time and man-hours that might otherwise be wasted.

Put Realism Into Guarantees. When every component is proved sound by a betatron, many of the breakdowns that require servicemen's time or expensive replacement will be completely eliminated.

WITH THESE KINDS OF SAVINGS, it is no wonder that many management and operating men are getting information about Allis-Chalmers new inspection tool, the 22-million-volt betatron. It lets you inspect castings or forgings for hidden flaws or alignment of parts quickly and efficiently. It detects flaws only .040 inch deep in a steel section 8 inches thick. Cracks only .002 inch wide are readily detectable.

Get complete information. Consult the A-C office nearest you or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4548

ALLIS-CHALMERS



imum wage to 90¢ an hour is approved by Congress, the U. S. Labor Dept. estimates.

Department says the average yearly income of workers affected would be increased by \$180 if the proposal is accepted, implying that this would be more money for the workers to spend for goods and services.

This is expected to be one of the principal arguments used by proponents of the higher minimum wage when debate begins in Congress. The figures will probably be magnified by the labor unions and others seeking to raise the minimum wage as high as \$1.25 an hour.

The Department's figures do not include indirect effects such as increases which would be required for higher-paid employees to preserve normal wage differentials, or for higher rates of overtime pay.

Nor does the Department make any mention of the possible results of broadening coverage to include some 3 million retail workers—proposed by several congressmen—giving rise to the theory that the Administration may have abandoned attempts to extend coverage for this year.

Push Plant Safety

Federal money and supervision would be used to "aid" states in promoting industrial safety programs under a bill now being considered in Congress.

Terms of the proposal call for allotting funds to states on the basis of the number of wage earners, industrial hazards, financial need, and other "relevant factors." Each state would get a minimum grant of \$15,000 a year, and would be required to supply matching funds of at least 25 pct of the total expenditure in the first 2 years, 33 pct in the second 2 years, and 50 pct thereafter.

GOP Offers Bill

To qualify, a state would be required to designate an agency to administer safety laws; provide training programs, and to promote voluntary safety programs.

Sen. H. Alexander Smith, R., N. J., is sponsoring the measure

along with seven other GOP senators. The bill follows President Eisenhower's recommendations. He has requested \$2 million in fiscal 1956 to promote industrial safety.

WASHINGTON NEWS

Reserves:

U. S. lowers second-quarter levels on copper products.

Reserves of copper-base products will decline in the second quarter, reflecting a lower military demand for most of these items, the government reveals.

Business and Defense Services Administration says reserves will total 108 million lb, a drop of about 18 million lb or 14 pct from the current quarter. The 108 million lb includes quantities needed for military and atomic energy projects, plus amounts for defense-related "B" products.

Mill space reserved for unalloyed brass mill plate, sheet, strip, and rolls is reduced from 8 to 7 pct; for rod, bar, shapes, and wire from 11 to 10 pct; and for seamless tube and pipe from 6 to 5 pct.

Less Wire and Cable

Reserve for alloyed brass mill plate, sheet, strip, and rolls is reduced from 12 to 8 pct; for alloyed rod, bar, shapes, and wire it is unchanged at 5 pct; and for alloyed seamless tube and pipe it will rise from 19 to 20 pct.

Copper wire and cable mill reserve for second-quarter deliveries will be 7 pct, while in the current quarter it is 8 pct. Copper foun-

dry product reserves will rise from 7 to 8 pct. No reserve space is planned for unalloyed copper powder mill products.

Reserve for military ammunition cups and discs is 40 pct of mill space. BDSA no longer issues production directives for these items.

Membership Worth \$3000

A machinist's loss of membership in his union for alleged Communist activities would cause him damages in excess of \$3000, the U. S. Court of Appeals rules in deciding that a Federal Court has jurisdiction to hear his appeal for reinstatement.

The Court finds that the machinist's salary and loss of collective bargaining benefits as a result of being expelled "would soon exceed \$3000." The machinist was expelled for alleged Red activities from Lodge 688 of the AFL International Assn. of Machinists in St. Louis where he earned \$137 a week as a tool and diemaker at the Anheuser-Busch Inc. plant.

Export Loans Set

New credit lines have been authorized by Export-Import Bank for three industrial machinery and earthmoving equipment producers.

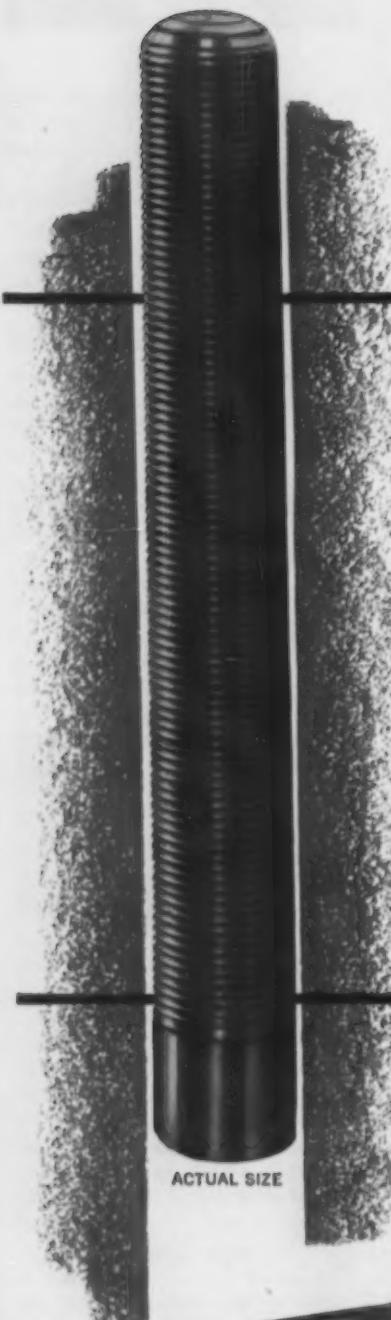
Bank has established a guaranty of up to \$875,000 to insure conversion to dollars of the income from sales made by Caterpillar Tractor Co., Peoria, Ill., to its Venezuelan distributor. The Caracas firm, International General Electric Co., must pay in cash at least 20 pct of the invoice value of each sale.

The Yoder Co., Cleveland, has a \$250,000 credit line to assist in financing export sales of metalworking and forming machinery for production of metal strips, sections, pipe, and tubing.

Recipient of a \$200,000 credit line to help in financing export sales of knitting machines is the Supreme Knitting Machine Co., Inc., Ozone Park, N. Y. Credit moves are seen improving U. S. position in dollar-shy markets.



"Can't you just hand me the letter opener?"



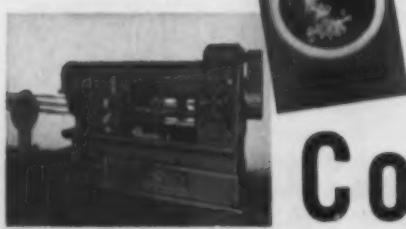
when the odds don't have it...

Before putting the chips down it is well to realize that reliable machine performance is largely dependent on well balanced tooling. If it is a multiple spindle bar automatic, an even number of work spindles provides a better opportunity for balance than an odd number.

Odd or even, the work spindles are only one of many important considerations in the selection of an "automatic". Other factors also important to the individual machine user are suggested by the new Conomatic General Datalog. Copies are now available.

data for comparison

| | |
|------------|---|
| Part | Levelling Screw |
| Machine | 1½" Six Conomatic |
| Tools | 100% Carbide Tipped |
| Material | B-1112 |
| Stock Size | 1" Round |
| R. P. M. | { Work Spindle — 958 Opposed Spindle — 677 |
| Time | { 7.25 Seconds per Cycle 3.6 Seconds per Piece |



Conomatic }

CONE AUTOMATIC
MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.



WEST
COAST
REPORT

Expansions Highlight Western Scene

Add brass to already established western steel and aluminum industries . . . American Brass to build \$13 million, 15,000-ton mill near Los Angeles . . . See high demand for building, oil—By R. R. Kay.

• WESTERN metalworking marches on—with new and expanding industries as the order of the day. (See *THE IRON AGE*, Nov. 24, 1954, "Salute to the West.")

Already solidly established and growing: Steel—predict well over 6-million-ton far-western consumption this year; Aluminum—40 pct of nation's primary aluminum now produced in Northwest; Aircraft—\$6 billion backlog; Auto assembly—expect over 560,000 units this year; Electronics—volume may go up 20 pct to \$1 billion mark this year; and Ordnance—already at \$1-billion level. (See *THE IRON AGE*, Jan. 6, 1955, p. 221.)

Now there's another metalworking industry to watch grow in the West. A \$13 million brass mill is coming to the Los Angeles area. And this could spark a big, diversified nonferrous mill products and fabricating center.

What It Means . . . It's a good break for metalworking plants here. They'll be able to carry smaller inventories—as little as a quarter of their present stocks. They won't have long waits for material from the East. And, in times of shortages, they'll feel a lot more comfortable with a mill in their backyard.

American Brass Co.'s decision to build a mill on the West Coast stems from the rapid growth of industry in the area, president John A. Coe, Jr., told *THE IRON AGE*. The new mill will be ready in early 1957.

Estimated annual market for

brass and copper mill products is now 75,000 in the 11 western states—southern California alone consumes 50,000 tons. Biggest users are the booming home construction industry and the oil industry.

Products to come from the new mill are copper and copper-base alloys in sheet, strip, rod, tubing, irregular extruded shapes, and drawn copper products. Annual capacity will be 15,000 tons but optimistic westerners are pretty sure that demand will induce expansion.

No refining or smelting is planned at the new facility. Ingots will come from Montana, Arizona and Chile plants of Anaconda Copper Mining Co., American Brass's parent.

Construction of 330,000 sq ft of mill and office space will start soon on a 47-acre site in the Paramount district of Los Angeles County. About 500 employees will be needed. And Western headquarters will move from San Francisco to the new mill.

Greet New Firms . . . Parade of news faces is steadily broadening the ranks of West Coast industry. Here are more companies that started doing business here:

Northwest Manufacturing Co., Portland, Ore., opened shop for production of agricultural machinery . . . Brown Lamp Mfg. Co., Gardena, Calif., started production of brass floor and table lamps. The man to see is Leo Brown . . . Palm Manufacturing Co., North Hollywood, Calif., will make space heaters. L. B. Grannis is executive

vice-president . . . Tow-Bear Div. of Hudson House, Inc., Portland, Ore., is now making battery-powered warehouse tow trucks. . . .

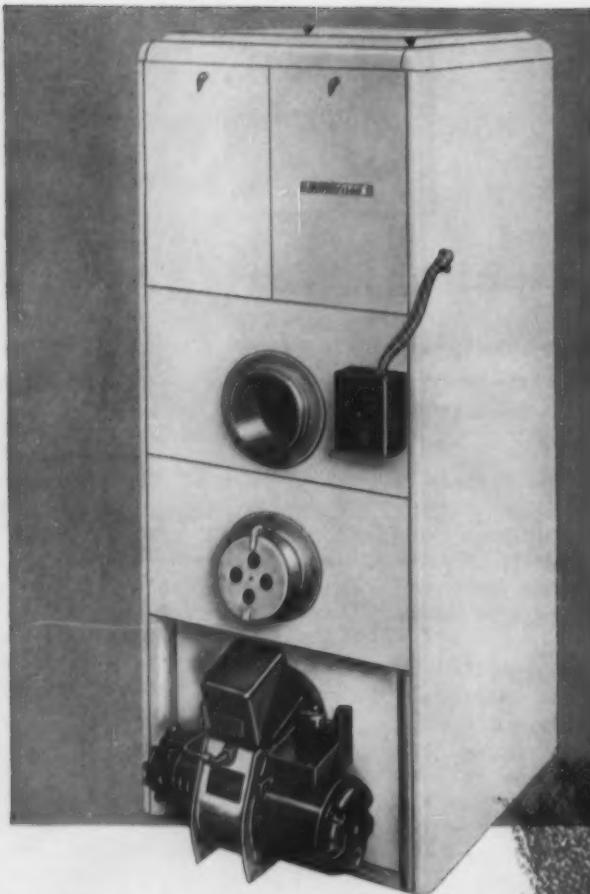
Construction Sheet Metal Works, Culver City, Calif., is open for business, serving the building industry. Glenn Spiker is president . . . Cal-Craft Trailers, Inc., El Monte, Calif., is building house trailers. . . .

National Tank & Pipe Div. of M & M Woodworking Co., Portland, Ore., will enter the plastic pipe field this year, making $\frac{1}{2}$ -in. to 8-in. plastic pipe . . . Trendware, Inc., South Pasadena, Calif., a new firm making all-aluminum sliding glass doors, is headed by Robert G. Smith . . . San Fernando Tool & Die Co., San Fernando, Calif., is now making tools and dies, jigs and fixtures. . . .

Flasher Electronic Corp., Los Angeles, is a new firm making warning devices and flashing lights. Top man is J. G. Chamberlin . . . Maco Mfg., North Hollywood, Calif., set up in business for prototype manufacturing of airframe parts, radar units, submarine parts and components.

Salute to the West

A limited number of copies of *THE IRON AGE* Salute to Western Metalworking industries are available. This special 40-page section, which was included with the November 25, 1954 *IRON AGE* outlines growth, potential and predictions for western industry.



If it's meant to get

HOT

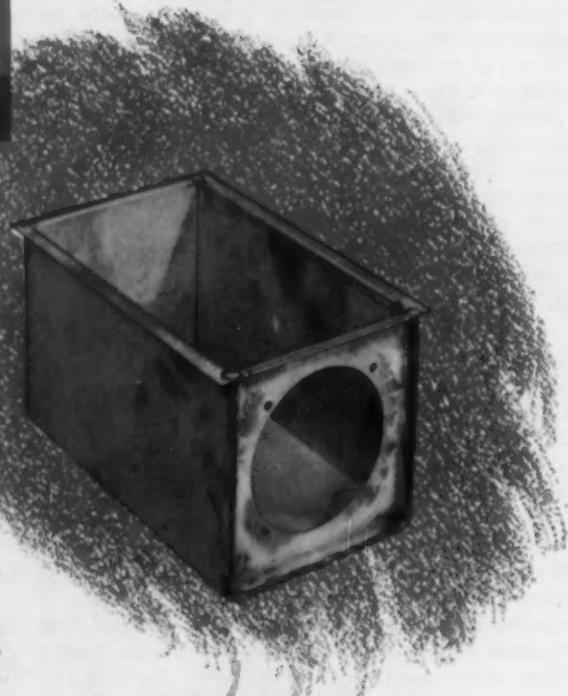
...use

CRUCIBLE STAINLESS

Say "stainless steel," and most everyone thinks of bright appearance . . . corrosion resistance . . . strength without excess weight. But these properties are actually secondary in some applications.

As an example, take stainless steel's remarkable resistance to heat. That's the reason why The Perfection Stove Company uses types 309 and 430 Crucible stainless steels for its gas- and oil-fired furnace components — fireboxes, throat and burner bowls, combustion chambers, and baffles. In the long run stainless is the most dependable and least expensive material they can use for these parts that get *REALLY HOT!*

Of course, in addition to heat resistance, Crucible stainless steels offer corrosion resistance . . . high fatigue, creep and structural strength . . . resistance to wear . . . and excellent workability. And at Crucible, stainless steels are made by specialists who are concerned only with special purpose steels. They welcome the opportunity to help you select the best grade for the job. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*



Crucible Type 430 firebox for the
Perfection OC 90V Oil-Fired Furnace.

CRUCIBLE

first name in special purpose steels

Crucible Steel Company of America



January Is Big Month For New Orders

New business total reaches 16-month peak . . . Shipments continue to lag following decline last year . . . Builders have improved backlog . . . Shipment upturn is expected soon—By E. J. Egan, Jr.

♦ JANUARY'S new orders for metal cutting machine tools inched up to a 16-month peak while shipments for the month continued their post-Korean slide. Effect of the unbalanced combination is to firm up builder's backlog to their best level since May, 1954.

New orders last month hit an estimated 203.6 on the National Machine Tool Builders Assn. index scale. This compares with a final 202.9 index figure for Dec., 1954. In dollars, January new business was estimated at \$60.2 million, up slightly from the final December total of \$60 million even.

Significant fact here is that incoming January business sustained the sharp upturn that occurred in December. It was only last November that new orders touched their low for the year: 119.5 on the NMTBA index and only \$35.4 million in dollar volume. A year ago, in January, 1954, the new order index was 173.5, representing \$51.3 million volume.

Shipments Fall Off . . . In contrast to the past two month's new order gains, machine tool shipments are still easing off. Preliminary NMTBA shipment index for January is 167.8, compared with a final 203.4 figure for December and 319.4 for January, 1954. In dollars, comparative shipment totals look like this: January, 1955—\$49.6 million; December, 1954—\$60.2 million; January, 1954—\$110.3 million.

Builders expect shipments to decline still more from last month's level. How much and for how long is uncertain, will depend

on future new orders. Odds are against shipments and new orders ever coming into balance because of the manufacturing lag between purchase and delivery. But if first quarter 1955 sales stay anywhere near Dec. and Jan. volume, shipment upturn could come in 2 or 3 months.

Have Bigger Backlog . . . Backlog for the industry was about 3.7 months at the end of January according to NMTBA. This gives builders a bit more cushion than the 3.3-month December figure. A year ago the industry reported a comfortable 5.6 months level of unfilled orders.

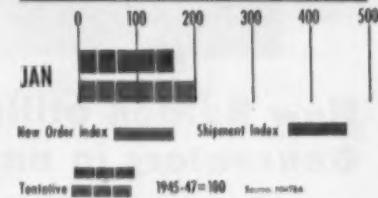
Source of the welcome new business gains for December and January is hard to pinpoint. NMTBA doesn't classify member firms' sales, either by tool types or major customer groups to whom they're sold. Nor is it possible for NMTBA to chart shipments. Builders don't indicate whether tools are sold for expansion programs, to improve metalworking processes or to replace retired obsolete equipment.

But a spot check of leading builders indicates that the automotive industry hasn't contributed as much, proportionately to the latest order gains. One machine tool builder had 20 units on a "reserve" order from a leading carmaker, was only awaiting the necessary formal OK before scheduling production. Instead, the auto firm cancelled the "reserve" commitment early in January. Only orders approved for completion were some which had been on the books for quite a while.

The builder was at a loss to explain the cancellation. Only assumption one spokesman could make was that it might reflect auto industry caution as the time for union contract negotiations draws near.

Report '54 Drop . . . Metalworking machine shipments by U. S. builders (cutting plus forming and shaping types), approximated \$1.1 billion in 1954. The 1953 total was nearly \$1.4 billion, accord-

MACHINE TOOLS, 1955



ing to a U. S. Commerce Dept. bulletin.

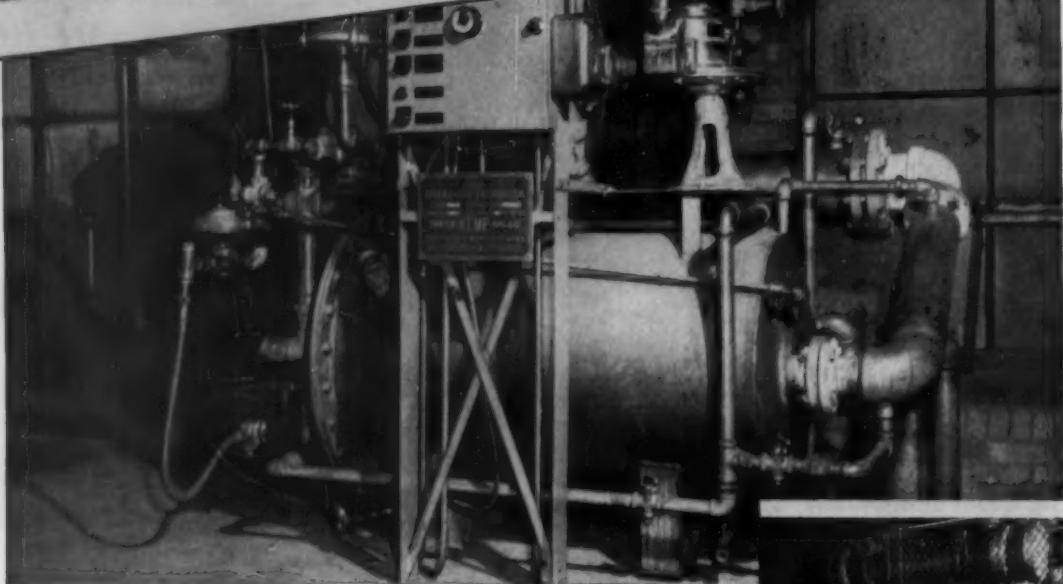
A breakdown shows that lathes accounted for 27 pct of total cutting-type machine tool shipments. Drilling equipment made up 15 pct of the total, followed by boring, milling and grinding machines with 14 pct each.

Mechanical presses represented a heavy 57 pct of all forming and shaping machine shipments. Mechanical press dollar volume was \$164.8 million out of a \$251.3 million total for these tools.

Exports Lagged . . . On the export side, the bulletin said shipments of machine tool cutting types were 37 pct less during the first 9 months of 1954 than they were in the same 1953 period.

Case No. 61

Kemp Inert Gas
Generators more
dependable at
Belden Mfg. Co.



How Belden utilizes two Kemp Generators in annealing copper wire

Annealing copper wire necessitates cooling in an oxygen-free atmosphere to prevent harmful oxidation. For the required protective atmosphere in this process, the Belden Mfg. Co., Chicago, Ill., generates its own inert gas. But the generating equipment formerly used by Belden did not operate reliably . . . results were erratic. So Belden installed two Model MIHE Kemp Inert Gas Generators to handle this important job.

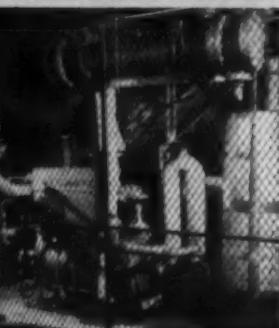
And Kemp Handles the Job

These two Kemp units assure Belden of a *dependable* inert supply. They deliver a more constant flow at the rated pressure . . . have been operating smoothly and

satisfactorily since installation. Kemp's ability to produce a chemically clean inert at a *specific analysis regardless of demand* eliminates the danger of fluctuation at a critical stage.

Kemp Units Engineered for Service

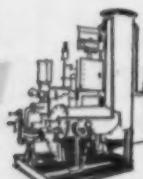
Like Belden, you specify reliability when you specify Kemp. Every Kemp design includes the Kemp Industrial Carburetor for complete combustion without tinkering, without waste . . . for simplified installation and maintenance. Every Kemp design includes the very latest fire checks and safety devices. Annealing, hardening, sintering—whatever your problem, find out today how Kemp engineers can help you.



Generator on first floor of plant is enclosed in wire cage to prevent tampering with controls.

For more complete facts and technical information, write for Bulletin I-10 to: THE C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.

KEMP
OF BALTIMORE



INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE DRYERS
SINTERING EQUIPMENT



The Iron Age

S A L U T E S

William M. Kelley Starting as an apprentice on a 13-hour day in a steel plant, he acquired a solid knowledge of the mechanics of steelmaking and learned to handle tough problems without long speeches.

William M. Kelley, president of Reserve Mining Co., is not a man to waste words. In times of stress he is apt to say, "Well, guess we'll have to have Mrs. Kelley come down to solve this one." And there will be fast stepping on problems that have been causing great despair.

This calm approach isn't surprising in a man who has been meeting problems head-on since leaving school in the eighth grade. Back in 1908, Mr. Kelley went to work for Carnegie Steel Co. as an apprentice drawing 17¢ an hour for a 13-hour day. On the side he was going to night school.

With these rugged days behind him, he doesn't wave his hands now when the pressure builds up a little. And his rise from apprentice to president has given him a solid background in the mechanics of steelmaking.

Coming from New Castle, in Pennsylvania's steel country, Mr. Kelley had his education

cut short by his father's death. He worked for Carnegie 7 years, then went to Minnesota Steel Co., Duluth, Minn., as mechanical foreman.

In 1922 he became construction foreman for Inland Steel at Indiana Harbor. He took a job as assistant master mechanic in Jones and Laughlin's Aliquippa works in 1925 and advanced to the position of general master mechanic.

He was named general master mechanic of Republic Steel's Youngstown district in 1930. In 1936 he was appointed works manager of the Youngstown plant of the Truscon Steel Co., a Republic subsidiary. His work in gearing the plant for war production resulted in an Army-Navy "E" award.

He became assistant vice-president in charge of manufacturing divisions at Republic in 1944 and was named vice-president in charge of operations in 1949. In October of 1954 he was made president of Reserve Mining Co., owned jointly by Republic and Armco Steel.

TORRINGTON Spherical Roller Bearings are used in every kind of heavy duty application requiring high load capacity, resistance to shock and wear under conditions of misalignment.



TORRINGTON Spherical Roller Bearings

are manufactured with accurate geometrical conformity between races and rollers for ultimate capacity and performance.

Because conformity factors are uniformly high, rollers can operate with a minimum of friction and carry greater loads for a longer time.

There are other good reasons why **TORRINGTON SPHERICAL ROLLER BEARINGS** can guarantee superior performance. Races and rollers are precision ground to a high surface finish from the finest quality electric furnace steel available.

An integral center flange on the inner raceway gives positive radial and thrust stability against continuous high-speed,

high-load conditions. Fully machined, cast-bronze, land-riding cages—one for each path of rollers—allow thorough lubrication, reduce wear and lengthen bearing life.

Specify dependable, rugged **TORRINGTON SPHERICAL ROLLER BEARINGS** in your equipment. They're available with either straight or tapered bore for shaft or adapter mounting.

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TORRINGTON **SPHERICAL ROLLER BEARINGS**

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

The Iron Age INTRODUCES

H. E. Brumder, elected vice-president in charge, Downingtown operations, **Pressed Steel Tank Co.** **C. E. Stender**, elected secretary and treasurer.

Thomas J. Golder, named sales representative, **American Cyanamid Co.**, Metal Chemicals Section, Atlanta.

Uriah W. Davis, appointed chief metallurgist, Titusville, Pa. plant, by **Universal-Cyclops Steel Corp.**

Charles H. Lundquist, elected president, **Western Sealant Co.**, Culver City, Calif.

George C. Gentry, named director of engineering and development, **Edgewater Steel Co.**, Pittsburgh. **Ross M. Heyl**, appointed general superintendent; and **Paul J. Nicholas**, operating superintendent.

Frank R. Basney, appointed credit manager for all divisions of **Niles-Bement-Pond Co.**, W. Hartford, Conn.

Paul L. Gallagher, named manager of pipe sales, **Claymont Steel Products Dept.**, **Colorado Fuel & Iron Corp.**, Wilmington, Del.

Alfred C. Ryan, appointed manager, **Merchandising Div.**, **Houdeille-Hershey Corp.**, Detroit.

James G. Winnette, named manager, Peoria district, **Allis-Chalmers Mfg. Co.**; and **George E. Schultz**, appointed general foreman, pattern shop and brass foundry, Norwood Works.

Warner B. Bishop, elected assistant vice-president, **Archer-Daniels-Midland Co.**, Cleveland.

James R. Leep, becomes service manager, **Hyster Co.**, Western Div.; and **Allen G. Owen**, becomes service manager, San Francisco.

Charles H. Hallett, appointed assistant manager of sales, Chicago plant, **Joseph T. Ryerson & Son, Inc.**

George D. Billock, joined **Hubbard & Co.**, Pittsburgh, as vice-president and treasurer.

R. W. Carr, named purchasing agent, **Ryan Aeronautical Co.**, San Diego.

Donald P. Day, appointed assistant treasurer and assistant secretary, **Westinghouse Electric Corp.**, Pittsburgh.

Paul R. Totten, promoted to superintendent, **Allenport Sheet Div.**, **Pittsburgh Steel Co.**; and **William C. Ackerman**, named assistant divisional superintendent.

Jay W. Schnackel, named vice-president in charge of manufacturing, **International Business Machines Corp.**, headquarters in New York. **Arthur L. Becker**, becomes general manager, Endicott, N. Y., plant.

Stanley A. Ashyk, appointed plant mechanical engineer **Republic Steel Corp.**; and **Edward H. Mroz**, becomes plant industrial engineer, Elyria plant, **Steel and Tubes Div.**



STEPHEN D. MOXLEY, named president, **American Cast Iron Pipe Co.**, Birmingham.



N. DOUGLAS MACLEOD, JR., named executive vice-president, **Abrasive Machine Tool Co.**, E. Providence, R. I.



ROBERT E. HARVEY, elected executive vice-president in charge, **Steel Div.**, **Merritt-Chapman & Scott Corp.**, N. Y.



MILTON T. SMITH, elected executive vice-president in charge, **Equipment Div.**, **Merritt-Chapman & Scott Corp.**, N. Y.

For Stampings
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Ever think how much time
 good quick service saves
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Excellent service — proved
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 years — is another of the
 many plusses you get when
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 you buy stampings!

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 COMPANY**



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"America's Best-Known
 Jobbing Stampings Manufacturer"

PERSONNEL

Roger M. Wolcott, promoted to
 assistant to the vice-president;
 Engineering & Plant, **Jones &
 Laughlin Steel Corp.**, Pittsburgh.
John F. Pollack, promoted to su-
 perintendent, Open Hearth. **Wal-
 ter T. Sergy**, promoted to assistant
 superintendent, Open Hearth
 Dept.

Charles E. Bosworth, appointed
 assistant general purchasing
 agent, **Ford Div., Ford Motor Co.**,
 Dearborn.

Quentin F. Ebert, named direc-
 tor of purchases, **Columbia-South-
 ern Chemical Corp.**, Pittsburgh.

Roy M. Nelson, appointed repre-
 sentative, **Miles Machinery Co.**,
 Saginaw, Mich., in the Detroit
 area.

George S. McLaughlin, appoint-
 ed general credit manager, **Har-
 bison-Walker Refractories Co.**,
 Pittsburgh.

Harry R. Rowland, elected gen-
 eral manager of sales, **A. M. Byers
 Co.**, Pittsburgh; and **Edgar L. Fix**
 to manager of steel sales.

Eugene Easterly, appointed vice-
 president-distribution, **Linde Air
 Products Co.**, New York, a division
 of Union Carbide & Carbon Corp.
E. G. Hickling, appointed vice-
 president-operations.

Howard R. Johnson, promoted to
 assistant factory manager, **Eaton
 Mfg. Co.**; and **C. A. Kurrash** be-
 comes plant production engineer,
Valve Div., Battle Creek, Mich.

George W. McCarty, named
 chief engineer, **The Black &
 Decker Mfg. Co.**, Towson, Md. Mr.
 McCarty succeeds the late Glenn
 C. Wilhide.

William H. Kinney, appointed
 resident metallurgical engineer
 for **Kaiser Steel Corp.**, Oakland,
 Calif., and **Richard L. Erlin**,
 named manager of engineering
 sales.

Harold C. Warner, appointed
 midwest district manager, **Chi-
 cago, Luria Engineering Co.**



ROBERT T. KELLER, vice-president,
 Chrysler Corp., placed in charge
 West Coast automotive plant op-
 erations.



J. JOSEPH KELLY, appointed sales
 manager, **Read-Prentice Corp.** Worcester,
 Mass.



R. P. GANCHAN, named vice-
 president and general sales man-
 ager, **Automotive Rubber Co., Inc.**



R. H. GLEZEN, named vice-presi-
 dent and general sales manager,
Automotive Rubber Co., Inc., De-
 troit.



"Steel from the Furnaces." Agnes Potter Lowrie depicts some of the basic steel products which provide the sinews of American industry. The I-beam, key piece in building construction. The angle iron. Wire rope. Railway track to carry the carriers of industry. The can, universal container for foods and liquids. And in the background, sheet steel, gleaming symbol of strength and durability. Limited edition of 15 x 18 full-color prints available. Copy on request.

The Fine Art of Steel Making #II

Too often, estimates of the steel industry concentrate upon our overwhelming productive capacity. Yet more than a little credit is due another American talent—the ingenuity of research coupled with the ever-readiness of steelmen to adopt new and better products and processes.

As recently as World War II, some of our largest mills were fearful of shutdowns because palm oil, then considered the essential lubricant for cold rolling tin plate, was obtainable only from foreign sources and had to be imported across U-boat-infested waters.

Research tackled the problem. Three years ago Ironsides announced Palmoshield as the first domestic replacement for imported palm oil. Within six months two-thirds of our major tin plate mills were using or testing it, often with remarkable results. For example, one company stepped up production 15% with no additional investment, no increase in labor, and no change in mill operation.

Recognized as today's most significant

advance in lubrication, Palmoshield offers five distinct advantages:

1. Produced in the heart of the steel industry. Users need not stockpile.
2. Made from freely available domestic materials.
3. Subject to exact chemical control — free fatty acid content to within $\frac{1}{2}\%$.
4. Price is not artificial, but fluctuates freely with the domestic fat market.

5. Proved in production to deliver increased tonnage at less cost.

Ironsides research, which developed Palmoshield, is geared to the future. A flexible team — the "custom tailors" of lubrication — Ironsides engineers are available for technical assistance on special problems of any nature or size. A letter will summon them without obligation. Address The Ironsides Company, Columbus 16, Ohio.

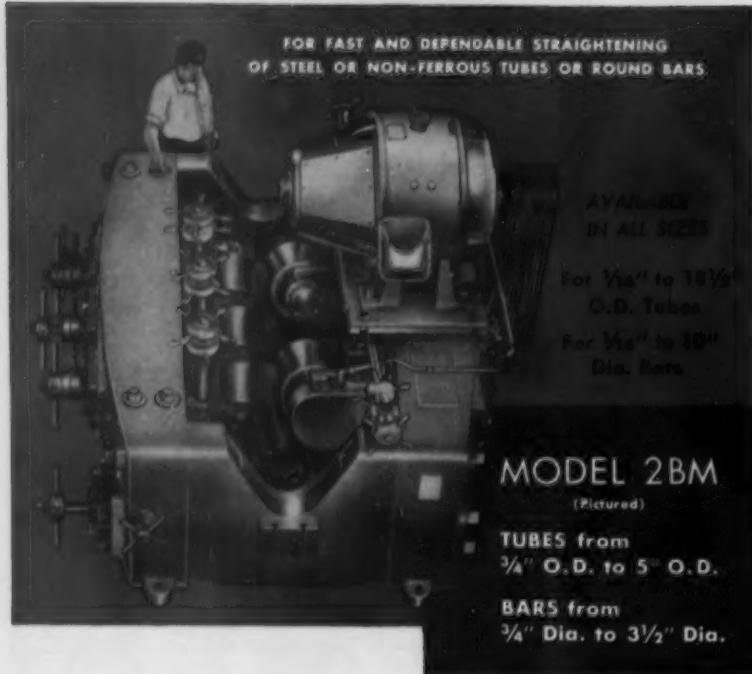


Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"



USE **SUTTON 5-Roll**
STRAIGHTENERS



Steady dependable production at high speeds to 800 feet per minute. Because only one roll of each pair of cross rolls is driven, wear is reduced and roll life lengthened.

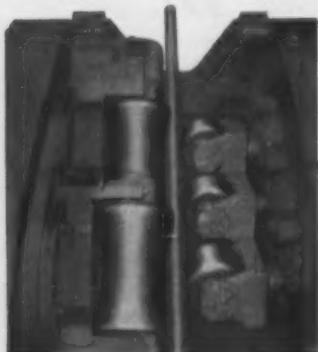
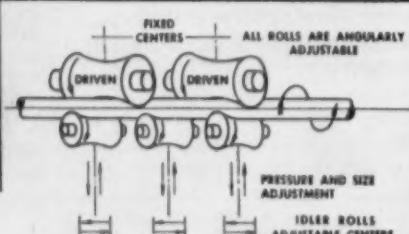


Photo and diagram of 5-roll design shows engineering principle of driven rolls with opposed idler rolls.

- DEPENDABLE SERVICE
- HIGH PRODUCTION
- QUALITY STRAIGHTENING



Ask for Bulletin No. 25

SUTTON *Engineering* **COMPANY**

Manufacturers for Ferrous and Non-Ferrous Metal Industries

STRAIGHTENERS, EXTRUSION PRESSES, HYDRAULIC STRETCHERS,
SHEET LEVELLERS, GAG PRESSES, ROTARY CLEANERS,
HEAVY-DUTY UNIVERSAL JOINTS, ROLLS.

BELLEFONTE, PENNSYLVANIA

PERSONNEL

Russell B. Haydon, appointed sales representative, steel strapping division, The Stanley Works, with headquarters in Cincinnati.

Michael P. Apostolik, becomes manager, Wheeling Steel Corp.'s New York district sales office, succeeding Harold W. Schroeder, retired.

C. William Bailey, named manager, analytical service laboratory, Consolidated Engineering Corp., Pasadena, Calif. Robert C. Hoffman, appointed supervisor of application engineering, relating to the development and design of new analytical and control instruments.

Robert F. Lay, promoted to general sales manager, The Cooper-Bessemer Corp., Mt. Vernon, Ohio. Grant C. Woodward, appointed assistant general sales manager.

OBITUARIES

John K. Underwood, assistant to the vice-president, charge of sales, Tennessee Coal & Iron Div., U. S. Steel Corp., recently in Birmingham.

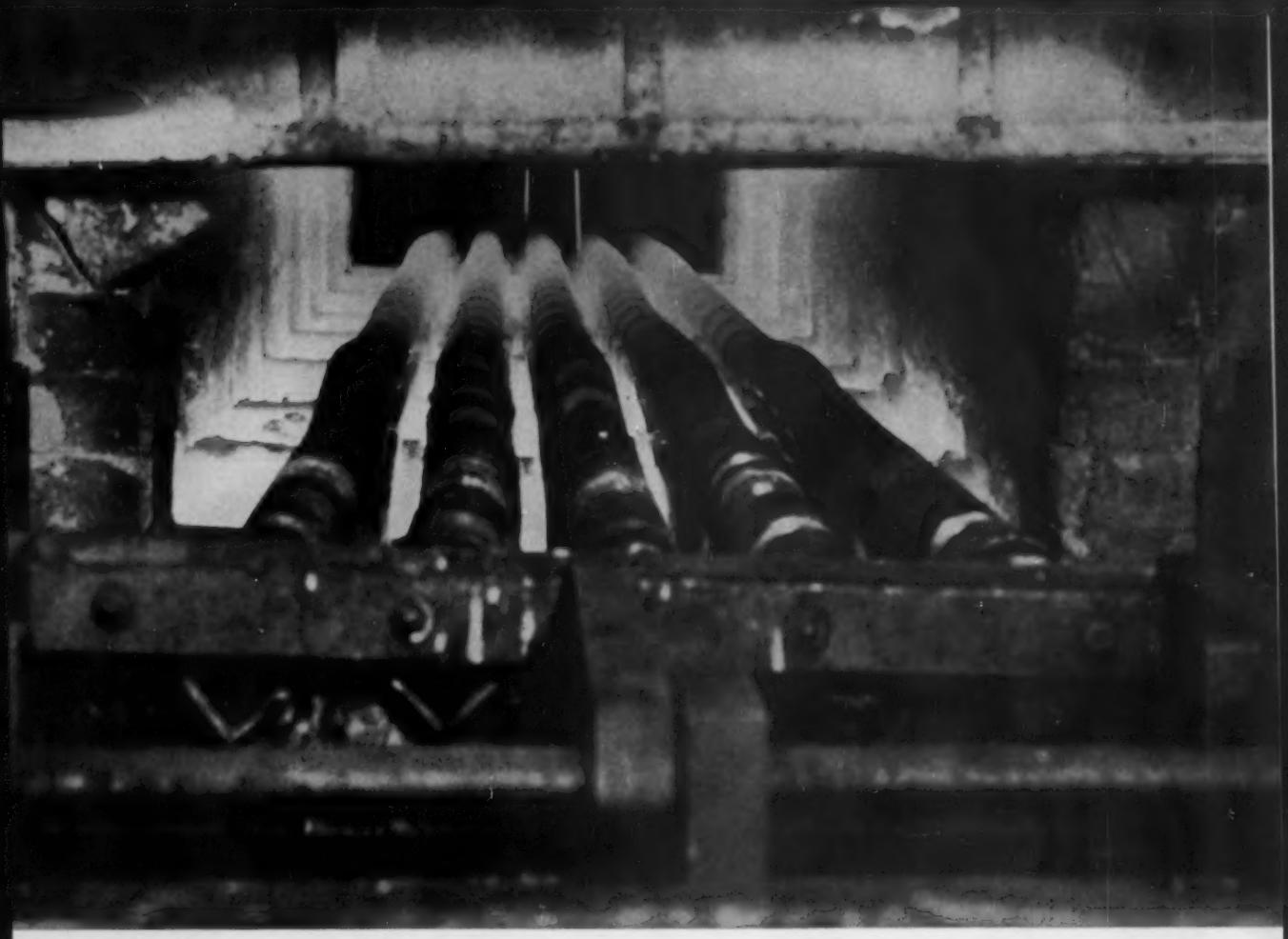
Henry Hardenbergh, 72, chairman of the board of directors, The New Jersey Zinc Co., recently in New Rochelle, N. Y. Mr. Hardenbergh had been with the company for 50 years.

John M. Gillard, 47, manager of sales, wire and wire products, Detroit Steel Corp., after a brief illness.

J. H. Shields, assistant marine sales manager, The Cooper-Bessemer Corp., unexpectedly at Mt. Vernon, Ohio.

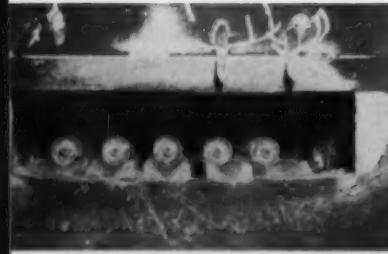
Gen. Brehon Somervell, president and chairman, Koppers Co., Inc., at his home in Ocala, Fla.

Thomas Sydney Quinn, 67, co-founder and treasurer, Lebanon Steel Foundry, Lebanon, Pa., recently at Miami. Mr. Quinn was a pioneer in the development of the manufacture of steel castings.



Service that ruins stainless steel rails in 2 to 3 months leaves...

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After two years, here's how the trough-shaped CARBOFRAX skids look—practically untouched by the thousands of steel blanks that have slid over them.

CARBOFRAX silicon carbide skid rails have already outlasted stainless steel rails 8 to 12 times in this pusher-type heating furnace...and are still in service! The side-fired gas-burning furnace is used by J. W. REX COMPANY, LANSDALE, PA., to heat 13-pound circular steel blanks to 1590°F at a rate of 115 blanks an hour.

The stainless steel skids the Rex Company used before failed regularly every two to three months, while frequent shutdowns to straighten or replace the rails ran up operating costs and curtailed output.

Silicon carbide's hot strength and resistance to wear at the operating tempera-

ture have completely eliminated these shutdowns...there hasn't been one since the CARBOFRAX rails were installed in May, 1952. And the heat conductivity of the trough-shaped CARBOFRAX skids assures that the blanks get uniform heating.

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They're leaded...
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**available in both Bessemer
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J&L LEADED STEEL BARS PROVIDE:

1

Faster Machinability... because with J&L's Leaded Steels much higher cutting speeds are possible.

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3

Improved Surface Finishes... because J&L's Leaded Steels machine to fine surface finishes.

4

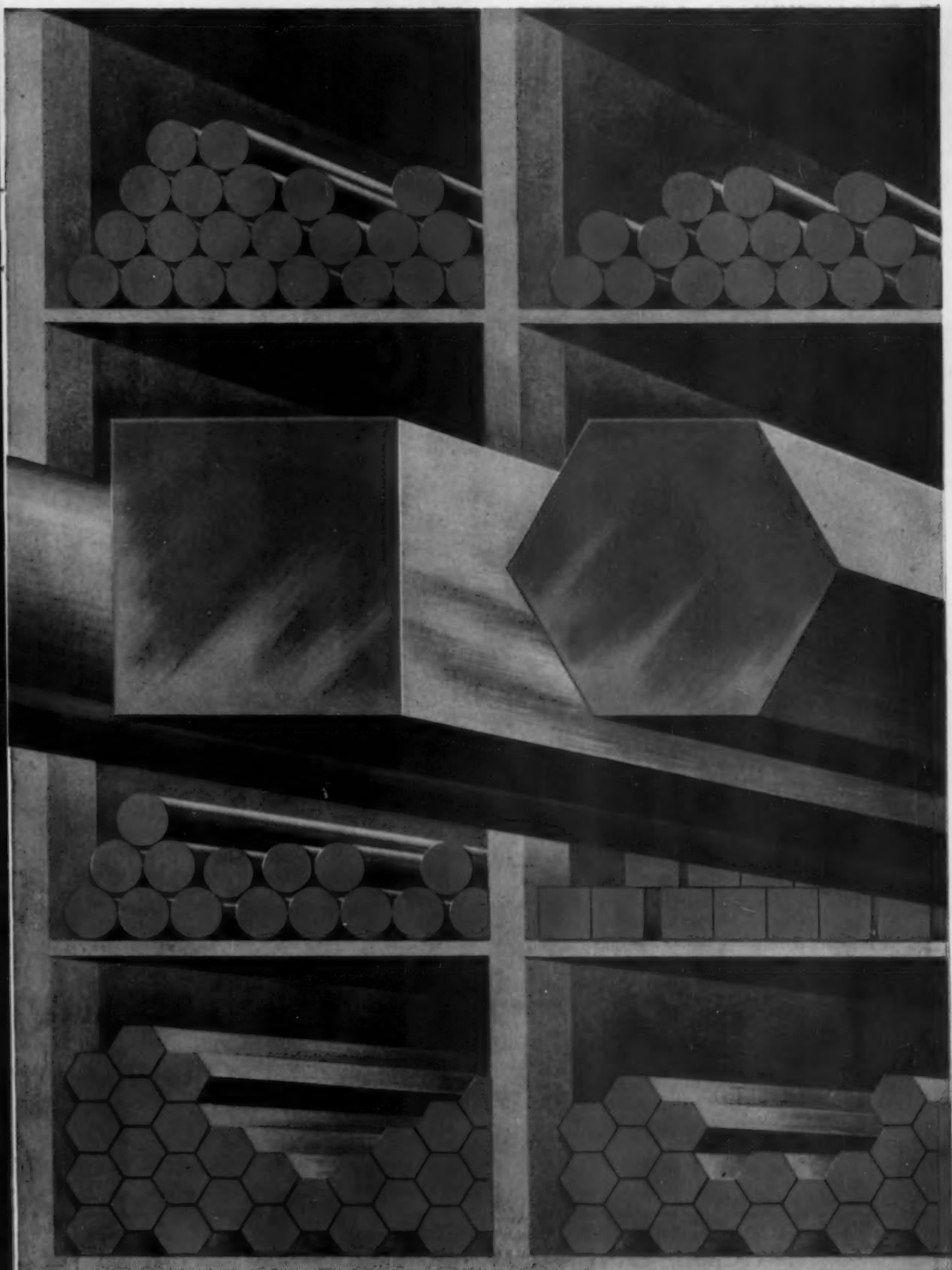
Lower Overall Costs... because the free-cutting qualities of J&L's Leaded Steels boost production and, at the same time, reduce part rejections.

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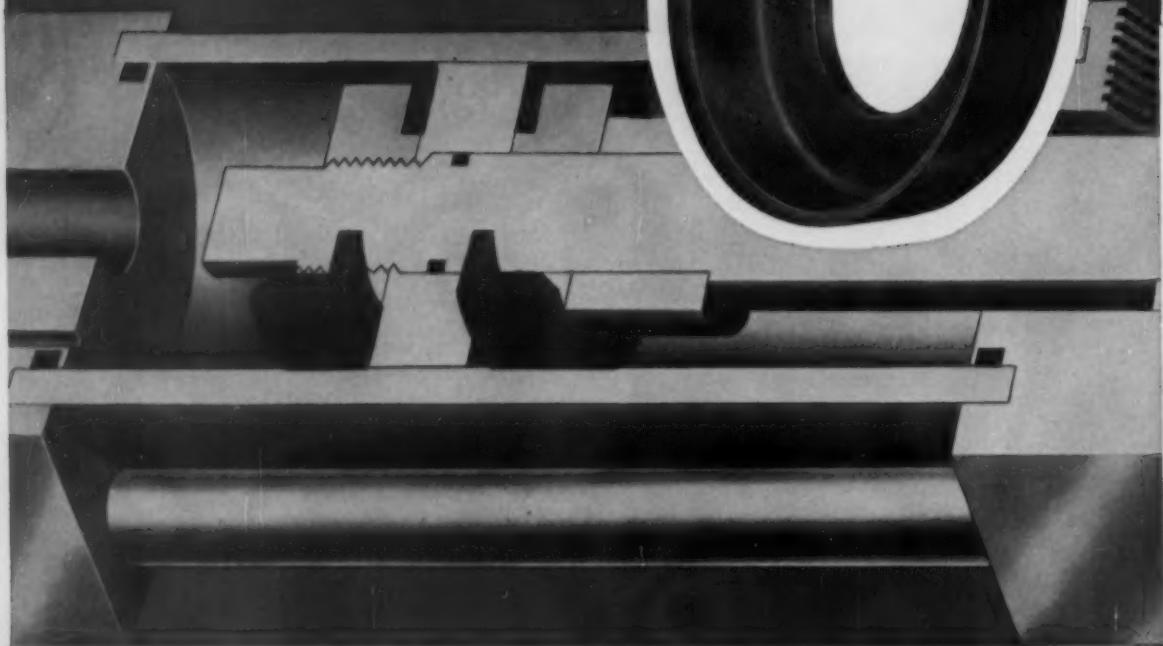
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Automatic routing—

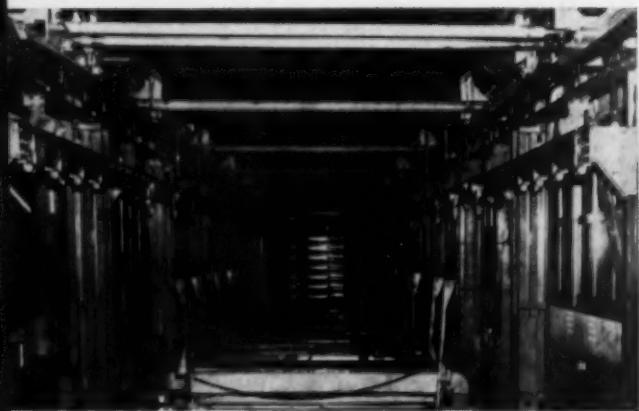
High-Production Line Deposits

Quality Chrome Plate on Bumpers

By HERB CHASE, Consultant, Forest Hills, N. Y.

♦ Efficient, precise, dependable—best describe Oldsmobile's new high-production bumper plating line . . . It incorporates numerous devices to minimize handling, to produce exceptional finishes.

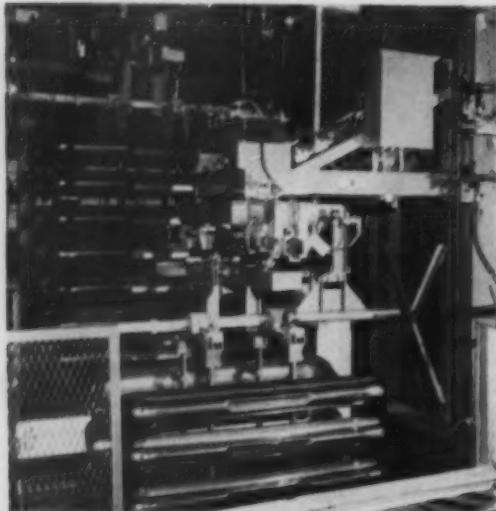
♦ Each conveyor carrier can be routed to a particular destination by merely setting a dial . . . It meets no interference from scores of other carriers . . . Transfer from one conveyor to another, or to a station, is completely automatic . . . Racks remain fixed in single cells during plating.



RACK-LOAD of bumpers passes through a copper plating cycle. Each rack occupies a single cell and stays in a fixed position. Plating thickness of the copper is 0.0015 in.

♦ PRODUCTION and plating of front and rear bumpers for passenger cars involve complex and difficult operations that demand exacting control and inspection. This is especially true when a minimum plating thickness of 0.002 in. and an unusually high degree of corrosion resistance are required. These and other important objectives have been attained in a highly mechanized setup now in full production in a new Oldsmobile plant in Lansing, Mich.

Nothing has been left to chance in this new installation. It was designed and built up not only to do the job to very exacting specifications, but to accomplish the results with a high degree of efficiency and dependability.



BUMPERS arrive at inspection station from which rejects can be rerouted to other stations for repairs by merely resetting a dial on the rack. No interference is encountered by rerouting.



SIXTY Hanson-Van Winkle-Munning generators supply current to the copper-plating line. One man keeps constant check on control panels to assure that proper current values are used.

Especially noteworthy are the handling methods which minimize manual labor and move the work to and from successive operations with amazing precision. Special cell-type plating conveyors are fed by and discharged to a Jarvis B. Webb Co. "power-and-free" conveyor. Handling of racks to, from and between plating and other operations is done with remarkable dispatch.

Each carrier of this conveyor has a dial which is set manually as each rack is picked up. It delivers the load to a particular location which corresponds to the dial setting. At the destination, the load is discharged automatically either onto a plating conveyor or at some other point such as an inspection station.

The routing system has been designed so that a load is delivered without encountering interference from scores of similar loads, some of which may be routed differently. If the unloading station is occupied, delivery is automatically postponed until the station is free, yet there is no piling up. If a serious delay occurs, partly processed work can be fed to a storage area and be fed back into regular production when the cause of delay has been overcome. This avoids complete shutdowns.

Although each load is intended to traverse a fixed course, some deviations are necessary. When defects are spotted at inspection stations, either the entire load or part of it is rerouted to undergo the necessary repairs.

The installation includes a maze of conveyors and several hundred interlock switches not only to prevent interference, but to keep

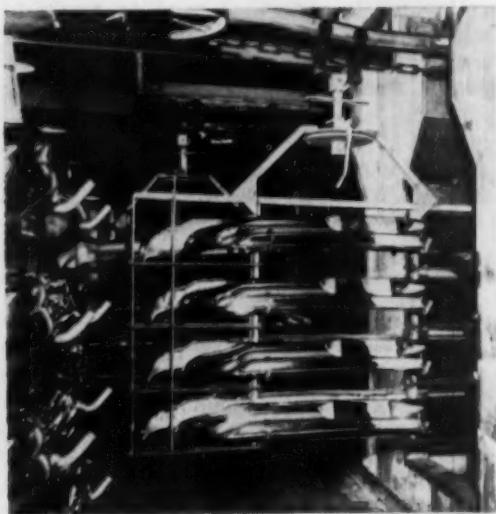
plating lines and supplementary equipment working as near to capacity as possible. It also allows for variations in processing. Besides being efficient, the system must maintain high standards in plating quality.

Buffing after forming is minimized by observing certain practices carefully. Only selected stock of high surface finish is used. Sheets are put through a roller leveler to minimize "orange peel" on the surface. Sheets are also passed through well controlled flat polishing and buffing machines. These must yield an average of not less than a 10-microinch RMS finish and substantially remove any remaining orange peel and pits, as well as produce the desired bright surface.

Washing, Bonderizing and waxing of sheets are also done primarily to provide a die lubricant which helps to avoid die marking in the forming presses. Handling through and between press operations is done partly with automated equipment to minimize scratching.

After the press operations, sharp edges are ground off with a hand disk and brackets are attached by welding. Bumpers then go through a power washer to remove wax and dirt. This includes an alkali wash at 160°F in the first stage, followed by a hot-water rinse and a hot-air blowoff.

Defects detected during inspection are repaired by hand polishing and buffing, using sisaline buffs. Bumpers are then hung on a monorail conveyor and moved to a point where they are placed manually on racks, each holding 12 to 14 bumpers. Racks are then picked up by



GLEAMING chrome-plated bumpers enter the last phase of processing. They move into oven where the plate is stress-relieved at 550°F. This treatment reduces cracking tendencies.

the power-and-free conveyor on which they move to the plating conveyors.

Before plating, however, racks of bumpers are carried through a demagnetizer, then passed through a five-stage washer. In the first two stages, two-phase cleaners are used at 120°F. These are followed by water rinses at 150°F in the next two stages and a hot-air blowoff in the final stage. Bumpers then undergo inspection. Any rejects are removed from the rack and routed back for repair polishing. Empty rack spaces are refilled.

Racks transferred automatically

From the power-and-free conveyor, racks are transferred automatically to a Hanson-Van Winkle-Munning copper plating conveyor. Processing at this phase begins with an alkaline spray wash at 190°F, followed by cathodic cleaning in a one-cell 4200-gal tank using an alkaline cleaner at 180°F for 140 seconds. Current density is 25 asf.

Next comes a 2-minute cold tap-water rinse in an overflowing tank with low-pressure air agitation, a 1-minute rinse in tap water at 150°F without agitation, and a 1-minute drain. Etching is then done in a 7800-gal Koroseal lined tank for 1 minute, using sulphuric acid at 52° Bé held at 80°F. Current is 100 asf or 14,000 amp per rack. There is no agitation, but the tank has a dam overflow and pump return. Time and current are varied as required.

Etching is followed by a 1-minute drain and a 2-minute cold tap-water rinse in which the water is air agitated and overflowed. There

is a top spray during work removal. A duplicate rinse follows in the next tank.

Anodic cleaning is done in the next tank, using an alkaline cleaner at 180°F for 2 minutes at 35 asf or 3000 amp per rack. This is followed by a single rinse, duplicating the one just preceding, and by a 2-minute dip in 5 pet sulphuric acid solution using cold water without agitation. A duplicate rinse in cold tap water follows.

This prepares the bumpers for 2-minute dip in a cathodic bath containing 6 oz sodium cyanide per gal of deionized water at 150°F without agitation. The copper strike is applied in a two-cell rubber-lined tank of 3,780-gal capacity. This solution contains 5 oz per gal of free copper cyanide, 1.5 oz per gal of free sodium cyanide and 0.25 oz Wes-X per gal of deionized water at 150°F. Duration of the strike is 4 min 43 sec at 25 asf. Plating for 10 to 15 seconds which is alternated with a reverse plate of 3 to 5 seconds, yields a deposit thickness of about 0.00008 in. Low-pressure air agitation is used. The solution is continuously filtered through equal parts of Pittsburgh carbon and Filterbestos filter aid.

Reclaim rinsing is done next in an 8800-gal rubber-lined tank of cold deionized water for 2 min, using low-pressure air agitation. Copper plating, the next step, is done in six four-cell tanks for 1 hour at 175°F, using 40 asf.

In copper plating, current reversal is used. It involves plating for 60 seconds and reverse plating for 55 seconds. Reversed current, however, is two-thirds that for plating. This results in a total copper deposit of 0.0015 in. Timers, reset by the racks, start the plating cycle. Low pressure air agitates the bath. The solution contains: 11 oz copper cyanide, 1.6 oz free potassium cyanide, 5 oz potassium hydroxide, and 0.5 oz Wes-X per gal of deionized water. Low current density electrolytic purification is done at a minimum of 70 amp-hr per week.

Each rack occupies a single cell and remains in a fixed position during plating. This differs from conventional copper-plating in which the work travels between long rows of electrodes. In the separate cells, electrodes are placed to deposit the plate more evenly over the bumper contour.

After copper plating, there are two 2 minute reclaim rinses in cold agitated deionized water followed by a 2-minute rinse at 150°F without agitation. Bumpers leaving the copper plating line are routed to an automatic copper buffering line where they are unracked, placed on individual jacks, buffed, reracked and inspected. Use of the power-and-free conveyor permits such routing by merely resetting the carrier dials. Before nickel plating, the bumpers are routed through the five-stage washer.

Paralleling the copper line is an enclosed area for generators. One man checks the control

equipment to assure that proper plating current is supplied to the many tanks in the line.

The first operation in the nickel plating line, which also uses a Hanson-Van Winkle-Munning conveyor, is cathodic cleaning for 2 minutes in an alkaline solution heated to 150°F. Current is 2000 amp per rack. No agitation is applied. This is followed by two 2-minute rinses in cold overflowing tap water with top spray during removal. Then comes a 2-minute cathodic cleaning in a solution containing 6 to 8 oz per gal of sodium cyanide which is used cold and not agitated. Current is 1500 amp per rack.

Next, is a 45-second cyanide copper strike at 150°F in a solution containing 4 oz per gal of copper cyanide, 2 oz per gal of free sodium cyanide and 0.4 oz per gal of caustic soda. Low-pressure air agitation and current density of 20 asf are used in this tank. The solution is filtered continuously through 10 lb of filter aid and 15 lb of Pittsburgh carbon. Following this is a cold 2-minute rinse in deionized water agitated by low-pressure air.

Bright nickel plating is done in two five-cell tanks containing 11 oz metallic nickel, 5 oz nickel chloride, 5 oz boric acid, 6 oz nickel formate, 0.30 oz cobalt sulphate, and 0.50 oz formaldehyde per gallon of deionized water. A pH of 3.6 is maintained. Cobalt salts are used to promote brightness as well as to improve ductility of the plate.

A heat exchanger automatically keeps the solution temperature at 150°F. Plating time is 26½ minutes at a current density of 35 asf (4,000 amp per rack), yielding a plate 0.0008 in. thick. Agitation is by low-pressure air. Electrolysis at 3 to 5 asf supplements mechanical filtration. Each of two filters holds 10 to 15 lb of Filterbestos, 100 lb of Pittsburgh carbon and 50 lb of Super-Filtrol.

Each cell holds one rack which remains fixed during plating. Anode arrangement is the most favorable for uniform plating. In these tanks, as in the copper plating tanks, woven diaphragms of nylon or polyethylene between the anodes and the work tend to trap dirt but permit the electrolyte to pass unhindered. Nickel anodes, originally bagged in cotton, are now bagged in orlon.

Racks move to inspection

Two 2-minute reclaim rinses in air-agitated cold deionized water follow nickel plating. Then comes a 2-minute rinse in deionized water at 150°F which is overflowed at 5 gpm. From this rinse, racks pass to inspection stations where rejects are removed and placed on other racks for delivery to a repair station. If necessary, they are rerouted for replating.

Acceptable bumpers move to other stations where they are reracked for chrome plating. These stations are equipped with foot-operated controls by which the large racks can be raised

or lowered to convenient handling height by powered equipment. This expedites reracking and simplifies handling. Racks for chromium plating hold only 10 bumpers.

In the chrome line, bumpers first pass through 1.5-minute cathodic cleaning in a solution containing 8 oz per gal of a mild alkaline cleaner held at 120°F without agitation. Current density is 20 asf. A cold rinse in overflowing tap water which is air agitated follows. Fresh water is sprayed on the bumpers during removal.

Bumpers get 20 second sulphuric dip

Bumpers are then dipped for 20 seconds in a 1-pct (by volume) sulphuric acid. The work is made the cathode and current density of 10 asf (or 1000 amp per rack) is applied. Air agitation is also used. This treatment activates the nickel surface. A cold rinse, the same as that preceding, follows plating. Next is a warm (115°F) rinse of 1.5 minutes without agitation in a 2-oz per gal solution of chromic acid in a rubber-lined tank.

Chromium plating is done in a three-cell 4850-gal tank. It is made of acidproof brick with Koroseal lining. The solution, containing 24 oz per gal of chromic acid and 0.08 oz per gal of sulphates is held automatically at 115°F by a heat exchanger and chiller.

Plating time is 2.5 minutes at 150 asf (12,000 amp per rack) which is sufficient to deposit an average thickness of 0.000015 in. No agitation is applied. This is followed by two duplicate 1.5-minute reclaim rinses in cold deionized water which is not overflowed or agitated. A still recovers the chromic acid from rinses.

Before completing the plating cycle, there is a 1.5-minute cold rinse in overflowing tap water with air agitation. This is followed by a hot (150°F) rinse without agitation in condensate from heat exchangers for the nickel and chromium tanks. Bumpers are then unracked and placed on an inspection conveyor. If bumpers need touchup buffing, it is done at this time. Bumpers then go through a single-stage washer using deionized water at 170°F for 30 seconds. An air blowoff to remove any cupped water follows.

Before final inspection, bumpers are conveyed through an oven for 25 minutes at 550°F to stress relieve the coating. After inspection, bumpers are either boxed for shipment to assembly plants or trucked in suitable racks to the main plant.

The installation also includes suitable storage tanks for each group (copper, nickel and chromium) of plating tanks. These facilitate periodic cleaning of plating tanks and provide a reserve for makeup. Extreme care is used to keep solutions and equipment free from dirt and contamination as well as to control all variables that may affect the plating quality.

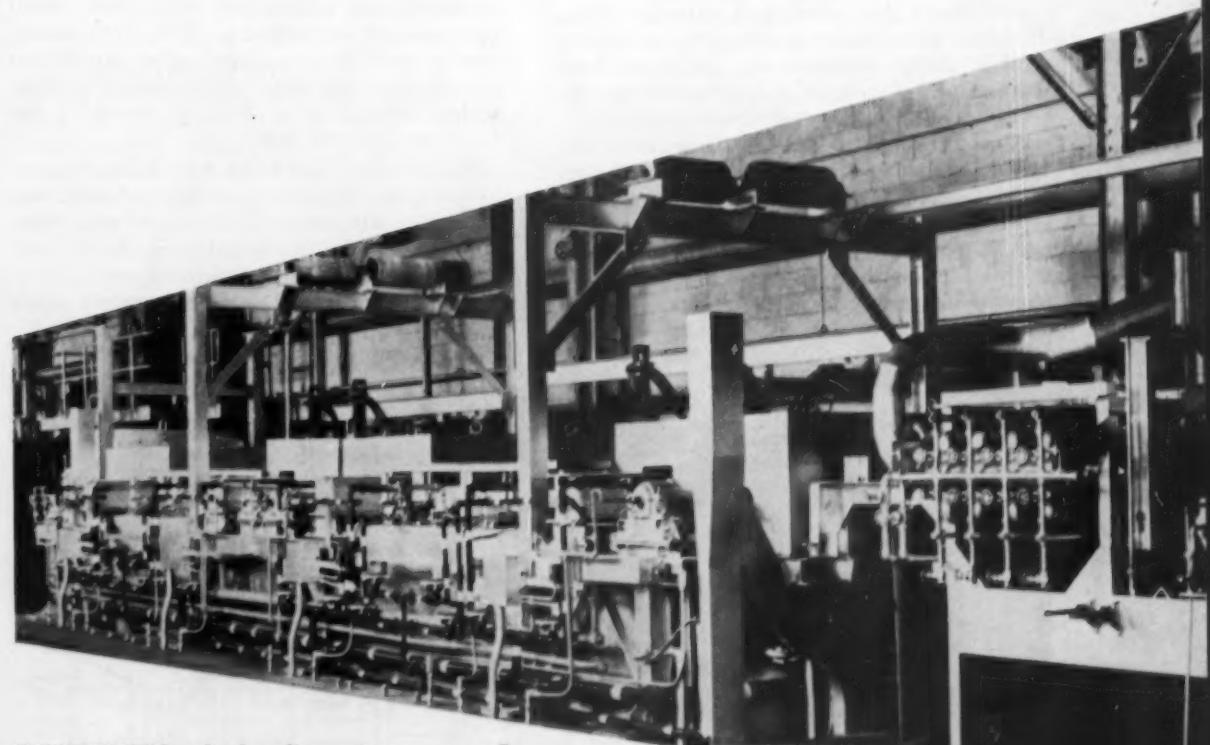
Electrolytic Salt Baths Descale Hot and Cold-Rolled Stainless Strip

By T. J. NOLAN, Chief Electrical Engineer
and G. E. ROWAN, Strip Mill Superintendent
Atlas Steels, Ltd., Welland, Ont.

- ◆ Use of electrolytic salt descaling permits processing all grades of stainless strip in a single continuous annealing and pickling line . . . A unit at Atlas Steels, Ltd. handles straight-chrome or chrome-nickel grades which have been hot or cold rolled, box or continuous annealed.
- ◆ Two descaling pots are used—one oxidizes the scale and the other dissolves the oxidized scale . . . The process minimizes handling, saves costs and floor space . . . Unit can handle two strips, each at different speeds from 5 to 50 fpm.

◆ IN DESIGNING a continuous stainless steel annealing and pickling line for its new mill, Atlas Steels, Ltd., Welland, Ont. was faced with problems peculiar to its immediate needs. At first, the market for stainless strip in Canada would be limited and would have to be developed. If hot and cold-rolled strip could be annealed and pickled in a single line, it would substantially reduce the initial investment in equipment. This approach was undertaken.

Requirements for the line called for descaling hot-rolled stainless strip of both the chrome-nickel and straight-chrome grades. The



ELECTROLYTIC salt descaling unit processes all grades of stainless—straight chrome and chrome nickel, box and continuous annealed, hot and cold rolled. No scale breaking is necessary.

methods studied included mechanical and abrasive scale breaking, and reduction of the hot-rolled annealed strip on cold mills to break scale, each followed by acid pickling.

Each of these processes involved certain limitations. First, separate equipment for scale breaking called for an additional investment. Also, there would be some deterioration of the strip surface. The cold mill of the Sendzimir type at Atlas would not be adaptable for reducing hot-rolled strip, thus a separate mill would be required. Furthermore, it would be impractical to install grinding facilities to eliminate surface imperfections resulting from mechanical scale breaking.

Investigate several methods

The same line would also be required to descale cold-rolled annealed stainless strip of all grades. It would have to provide any finish from a matte to a bright, easy-buffing finish. To accomplish this, several methods were investigated, including straight acid pickling, electrolytic acid pickling and use of a salt bath followed by acid or electrolytic acid pickling.

Use of salt baths and electrolytic acid pickling appeared most likely to produce the desired results. However, there was still another hurdle to overcome—that of obtaining a satisfactory job of descaling the tight, adherent scale on hot-rolled and annealed strip. This was particularly important on hot-rolled straight-chrome stainless strip which has been box annealed. Its scale is resistant to conventional salt baths and pickling treatment.

A continuous electrolytic salt descaling process which had been developed by Kolene Corp., Detroit, seemed to incorporate the essential requirements. Furthermore, Kolene erected and had in operation a pilot plant to process material in trial lots for steel producers. Since no strip had yet been produced in the new Atlas mill, coils of hot-rolled box-annealed type 430

(17-pct straight chrome) strip, about 0.125 in. thick and 10 in. wide, were purchased in the United States.

After processing this strip through the electrolytic salt descaling bath, it was pickled and cold rolled. These tests proved the process highly satisfactory. In fact, further work was undertaken to determine whether similar results could be obtained on other straight-chrome grades as well as on chrome-nickel grades. These, too, proved satisfactory and, as a result Atlas became the first mill to adopt the process for commercial production.

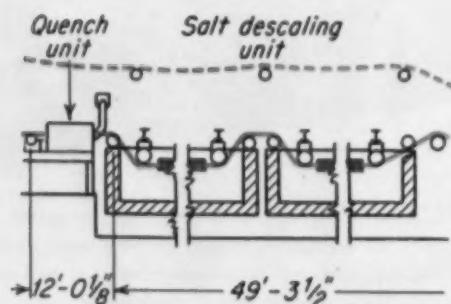
The annealing and pickling line handles two strands of strip up to 19 in. wide and 0.200 in. thick. Strip is handled from the uncoiler through the welder. It is stored in a looping pit to permit continuous running of both strands during spot welding. The loop is controlled by electronic eyes. Pinch rolls or drag wipers keep the strip at proper tension. After annealing, the strip is quenched with steam, air or water vapor.

Two tanks containing the Kolene descaling baths follow. Each is 18 ft long and 8½ ft wide. They are heated by gas-fired immersion burner tubes. From the second tank, strip passes through a water rinse. It then passes through three acid pickle tanks arranged as follows: (1) sulphuric acid, (2) dilute electrolytic sulphuric and (3) nitric acid with small additions of hydrofluoric acid. Scrubbing, rinsing and drying follow, after which the strands are recoiled. Each strand can be pulled through at a different speed in the range from 5 to 50 fpm.

The two descaling tanks have been designed to use most efficiently the direct current employed in the process. This current, when not required for the descaling tanks, is used by the electrolytic acid pickling unit. It is supplied by two Columbia generators, each rated at 5000 amp at 36 v.



PILOT MODEL salt descaling unit which proved that all grades of stainless could be treated in a single line. Its satisfactory performance led to first commercial setup at Atlas.



The salt baths are contained in steel tanks and operated at temperatures around 900°F. Pilot processing indicated that the grids should be connected to a direct-current source and be suspended in the molten salt. The strip would pass between the grids where descaling action would take place. However, when both positive and negative grids were installed in a single steel tank, the current took the path of least resistance and, as a result, jumped from grid to pot grid, or from grid to grid, rather than follow through the strip as was necessary to obtain good descaling.

To achieve maximum efficiency, the negative set of grids was installed in the first descaling pot. This pot is insulated from the second pot which contains the positive set of grids. The strip becomes the opposite polarity to the grids. The current must pass through the strip and the desired efficiency is thus obtained.

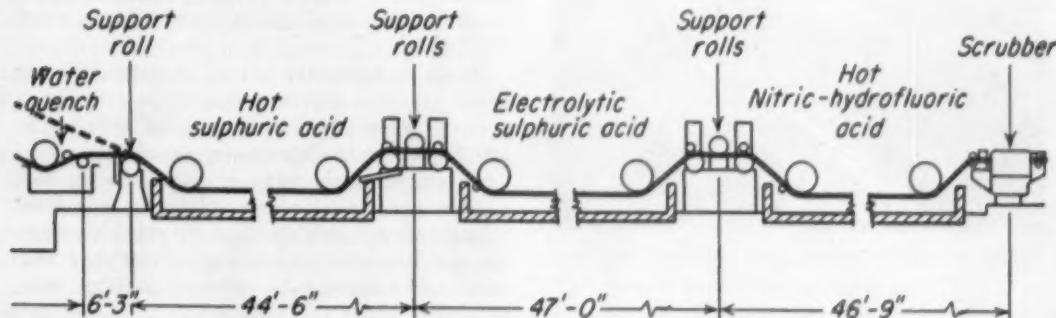
Chemically, the scale on the strip in the first tank is oxidized. When the strip reaches the second tank where nascent members are formed at the surface of the strip, this oxidized scale is dissolved. If acid pickling had been installed, the acid would not penetrate the tight, adherent scale. It would be necessary to provide a means of first breaking the scale to open surface fissures which would permit pickling to take place.

Oxides readily soluble

When strip leaves the electrolytic descaling bath, some oxides are still present on the surface. However, they are readily soluble in acid. Short immersion in a conventional acid removes these oxides.

Because of this dissolving action, purchase of extra equipment for scale breaking and preparing the surface for pickling is unnecessary. Thus, the entire job is accomplished in the single annealing and pickling line. It also eliminates additional material handling and the necessity for a larger inventory bank, all of which save time, floor space and produc-

DESCALING and pickling units can handle two strands of stainless strip up to 19 in. wide simultaneously. Each strip can be pulled through at a different speed from 5 to 50 fpm.



tion cycling and help reduce production costs.

Hot-rolled strip of either type 400 or type 300 stainless is pickled through all three acid tanks. The immersion rolls may be lifted quickly so that the strip may travel above the acid level of the first or third tank, as desired. All strip passes through the second tank because the grids used for electrolytic pickling prevent raising the strip above the acid level.

When strip is processed with an intermediate anneal to improve the surface of the final product, all three tanks are used. In this case, direct current may be used either in the descaling bath or in the second pickling tank.

When annealing and pickling the finished strip, current is always used in the electrolytic acid (the second acid tank). When a bright finish is desired, pickling is electrolytic only. When a heavily pickled (matte) surface is desired, all tanks are used, and the acid concentration and temperature are carried on the high side of the working range.

Setup solves problems

What is probably the most unique advantage of the process is that during the operation certain oxidizing agents are formed in the salt baths. The predominant one is sodium peroxide. When cold-rolled annealed stainless is to be processed, it is not necessary to supply direct current to the baths. Instead, the oxidizing qualities of the salts remained in the baths after current is shut off. Thus, the annealing scale is converted to an oxide which is soluble in the electrolytic sulphuric tank.

The installation has solved several problems. It is extremely versatile, giving satisfactory results on all grades of material: straight chrome (400-series), chrome-nickel (300-series), both hot-rolled and cold-rolled, box-annealed and continuous-annealed. Atlan has been able to produce a complete variety of commercial finishes on stainless strip by proper control and selective use in the pickling line.

Triple packing life—

Hard Facing Alloy Extends Hydraulic Pump Plunger Life

◆ Maintenance costs on an extrusion press are sharply reduced by coating hydraulic pump plungers with a hardfacing alloy . . . Treatment extends plunger service life and cuts frequent replacement of pump packing material.

◆ Powdered boron-nickel-chrome alloy is sprayed on grit-blasted plunger, then fuse-bonded to under surface . . . Hard facing has low friction coefficient, high abrasion and impact resistance . . . Process uses simple equipment.

◆ HARD FACING the hydraulic pump plungers of a billet extrusion press with a boron-nickel-chrome alloy has sharply reduced press maintenance costs at Scoville Mfg. Co., Waterbury, Conn. Low friction coefficient of the fusion-bonded alloy surface has virtually eliminated plunger wear. And useful life of the metallic packing used to seal the plungers has been more than tripled.

The pumps in which these plungers operate supply hydraulic pressure for extruding brass billets into rod or tube forms. Reciprocating action of the pump plunger imposes a serious sealing problem at its opening in the pump casing. Metallic packing is used as a sealer because of its low friction properties and good wear resistance at surface speeds of about 480 fpm.

Pump plungers are $3\frac{1}{8}$ in. in diam with exposed surfaces approximately 25 in. long. They operate against water pressure of 4250 psi at 120°F . Before the hardfacing program was undertaken, plungers made of air-hardening tool steel or carburized, chrome-plated carbon steel would become scratched in service. Average packing life with such plungers was only 86.5 days, and additions to existing packing were necessary about every 26 days.

The new plungers are made of 1020 steel spraywelded with Colmonoy No. 6 alloy powder. Following initial installation, these coated plungers operated 329 days without requiring additions to existing packing. When examined at the end of this period, the packing showed no signs of wear, nor was there any significant scratching of the plunger surface.

Avoid plunger warpage

Dollar savings from the new technique can be roughly estimated by considering that new packing costs \$25.00 for material, plus labor cost and lost production from the press.

Before applying the hard facing alloy, the plunger surface is grit-blasted. This insures positive mechanical bonding of the sprayed deposit to prevent any lifting during the fusing treatment.

After grit-blasting, the plunger is mounted between lathe centers. The Spraywelder pistol is mounted on the lathe tool post and the powdered alloy is sprayed on the rotating plunger. The lathe carriage traverses the spray pistol across the work to achieve a uniform coating.

For the fusing operation, the pistol is removed from the tool post holder. Plunger rotation on the lathe continues while an oxyacetylene torch flame is hand traversed over the sprayed surface. Plunger warpage is avoided by uniform application of the heat required to fuse the thin overlay.

Following the spray and fusion process, the plunger's hard face coating is between 0.045 and 0.050 in. thick. Finish grinding the plunger to required size removes about 0.020 in. of coating from the diameter. The plunger is then ready for installation in the pump.

Has excellent red hardness

The Colmonoy No. 6 alloy and Spraywelding equipment are furnished by the Wall Colmonoy Corp., Detroit. The nickel-base hard facing alloy has a hardness ranging from 56 to 61 RC. It is nonmagnetic, has a specific gravity of 7.80 and melts at 1900°F.

Among its other physical properties are high resistance to abrasion, corrosion, galling, and impact. The alloy also has excellent red hardness and low coefficient of friction. While in its plastic range from 1850° to 2050°F, it will bond easily to steels and stainless steels, also to certain cast irons and copper alloys. It can also be hot-formed without flowing or losing its shape.

The alloy spraying unit includes a pistol, hopper, carburetor, hoses, air regulator and air filter. The complete unit mounts on a panel that can be attached to a wall or to a stand adjacent to the processing lathe. The equipment requires oxygen and acetylene and a source capable of delivering 10 cfm of dry air at 45 psi.



HARD-FACED pump plunger shows virtually no scratches or wear after one year's service.



SPRAYING steel plunger with powdered hard-facing alloy using simple lathe equipment.



OXYACETYLENE torch flame is hand traversed to fuse the facing alloy to steel underbody.



HARD FACING extends service life of pump plungers in brass billet extrusion press.



FIG. 1—Graphite coated chills produced required density, correct size in three upper bores of this sand cast aluminum alloy fuel pump.



FIG. 2—Spraying colloidal graphite dispersion mixture on steel cores for fuel pump casting.

Colloidal Graphite Mixtures Aid Nonferrous Casting Techniques

- Sprayed coatings of colloidal graphite dispersions have many applications in nonferrous foundries . . . Graphite coated steel chills in sand or permanent molds produce dense structures and smooth surfaces, are easily "parted."
- Diecasting shops use colloidal graphite mixtures to coat cores, dies, pins, etc . . . Other applications extend to lubricating ingot molds, ladle cranes, swivels, heat treat oven car wheels, other high temperature mechanisms.

- COLLOIDAL GRAPHITE dispersions have many valuable applications in nonferrous foundry practice, regardless of whether the castings are made in sand, permanent molds or die casting machines.

These colloidal dispersions consist of microscopic and submicroscopic particles of electric furnace graphite suspended in various fluid carriers. Graphite particle sizes are such that they stay suspended in the carriers without agitation and with little or no settling. The small particle size also permits coating various objects with fine films of these dispersions so that there will be no dimensional change in the coated objects.

Graphite has several excellent basic properties that make it useful for various nonferrous casting jobs. The material (1) is highly refractory up to 3000°F in inert atmospheres, (2) does not react with aluminum and copper base alloys and is inert chemically, (3) does not absorb harmful gases, (4) has excellent anti-friction characteristics, (5) promotes rapid heat transfer and "chilling" because of its high heat conductivity, and (6) is an excellent "parting" material.

By W. A. Mader, Chief Metallurgist
Oberdorfer Foundries, Inc.
Syracuse, N. Y.

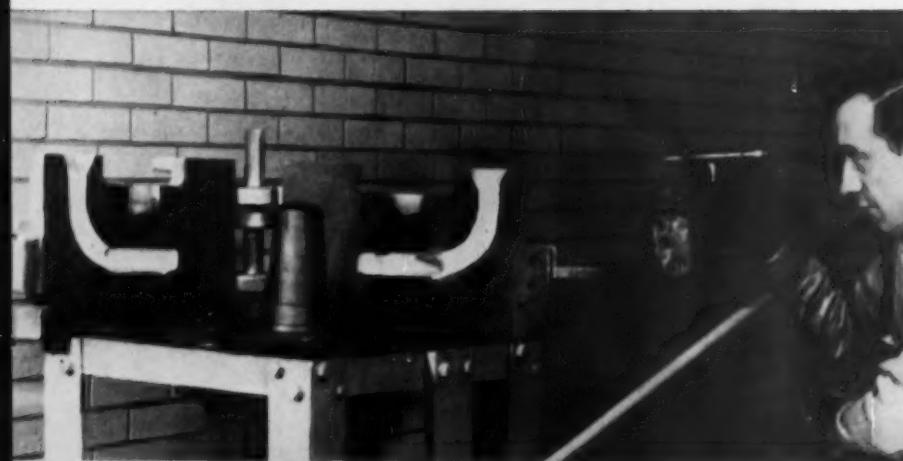


FIG. 3—Permanent mold core and cavity are sprayed with graphite mixture while riser and sprue areas get a white insulating coating.

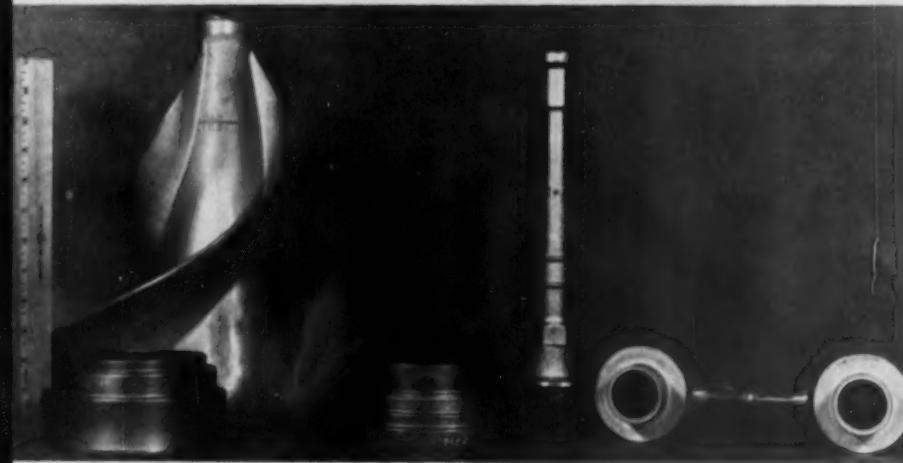


FIG. 4—Steel cores coated with graphite "part" easily from permanent mold castings.

Colloidal graphite dispersions, such as the "dag" dispersions produced by Acheson Colloids Corp., make excellent coatings for cast iron and steel chills used in nonferrous molds. Almost all the aforementioned graphite properties have some value in this application.

Must pass X-ray test

An example of the chill coating technique as an aid to good sand castings is found in an aluminum alloy jet engine fuel pump body produced by Oberdorfer Foundries, Inc., Sycause, N. Y. A section of the casting is shown in Fig. 1. The casting is subjected to high pressures. It must pass a stringent X-ray examination to insure freedom from all internal porosity. The bores of the three cavities in the top of the illustration must be cast with a very dense adjacent metal structure.

This casting is subjected to high pressures. It must pass a stringent X-ray examination to insure freedom from all internal porosity. The bores of the three cavities in the top of the illustration must be cast with a very dense adjacent metal structure.

The castings were made successfully by using three specially machined steel chills to give the required bore dimensions. In production,

the chills are sandblasted to remove any rust, cleaned in carbon tetrachloride to remove grease and oven heated to 350°F to remove any moisture. They are then sprayed with a solution of 1 part Aquadag to 3 parts water.

Fig. 2 illustrates the chill spraying method. After spraying, the chills are maintained at 450°F until they are placed in the mold, which is also thoroughly dried.

A close study of the photograph shows the dense metal structure and smooth surface of the bores. The steel chills were readily removed from the casting because the refractory graphoid film prevented the aluminum from fusing to them. Many other chill types are similarly coated with colloidal graphite dispersions to help produce sound sand castings.

Colloidal graphite dispersions are also used in the sand foundry to lubricate and eliminate binding in flash pins and bushings. And the high temperature anti-friction properties of these dispersions make them useful for lubri-

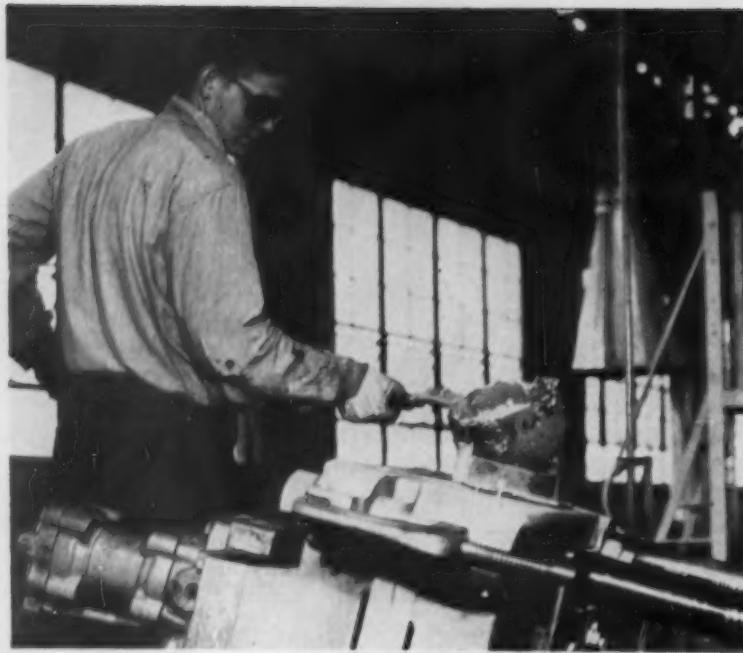


FIG. 5—Colloidal graphite mixtures lubricate these mold closing and ejecting mechanisms.

cating ladle cranes, swivels, heat treat oven car wheels, etc. Still another application is an ingot mold wash to reduce ingot sticking.

Permanent mold foundries and die casting plants can find many uses for colloidal graphite dispersions other than the more general applications already mentioned.

Clean mold before spraying

For example, one part of Acheson's Prodag dispersion diluted with about 5 parts of water plus 10 pct of sodium silicate is a particularly effective chilling agent to hasten heavy section solidification in permanent mold castings. It is applied by spraying a finely atomized mist of the mixture on the mold area to be chilled. However, the mold must be previously cleaned of any other coating and heated to 350° to 400°F before it is sprayed with the colloidal graphite mixture.

Coating produces smooth surfaces

In addition to densifying heavy casting sections by hastening solidification, the graphite coating produces very smooth cast surfaces. Fig. 3 shows the method of applying the dark spray mixture to the central core and mold cavity of a permanent mold for an aluminum alloy bushing. Riser and sprue areas of the same mold are given a white insulating coating to retain heat in these areas.

The excellent parting properties of colloidal graphite dispersions also make them very effective aids in extracting iron or steel cores

from permanent mold castings. In such cases, the cores are sprayed with 1 part of Aquadag to 20 parts of water.

Typical castings produced with the help of this core coating technique are the tall, thin, cylindrical cored pieces on the right of Fig. 4. The other permanent mold castings in this photograph are typical jobs produced by Oswego Castings Co., permanent mold and die-casting division of Oberdorfer Foundries, Inc.

When using colloidal graphite dispersions for mold and core coatings, it should be realized that mixture dilutions and film thicknesses may be varied to obtain satisfactory chilling, parting, and surface finish.

Fig. 5 shows the hydraulic mold closing mechanism, including guide bars and ejectors, on a typical permanent mold. Colloidal graphite dispersions are used to lubricate these mechanisms that operate at temperatures approaching 600°F. Either the oil carrier or water carrier colloidal dispersions are used because of their excellent high temperature lubricating properties.

In nonferrous die casting practice, colloidal graphite dispersions are used to coat cores, dies, guides, pins, etc. Mixtures and spray coating techniques are similar to those described for permanent mold castings. It facilitates parting, gives better surface finish and greatly reduces carbon build up on die impressions. Ejector pins so lubricated operate more smoothly with less sticking.



Replaces hand brushing—

Abrasive Blasting Reconditions Live Projectiles

♦ AN AUTOMATIC abrasive blast cleaning installation saves the Army money in reconditioning live bombs and shells which become rusty and corroded in storage. Replacing former manual wire brushing methods, the new system uses practically no manual labor. Three-year records at Letterkenny Ordnance Depot, Chambersburg, Pa., indicate the automatic setup saves approximately \$100,000 annually.

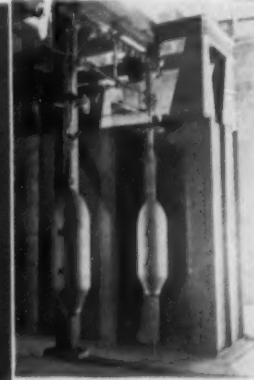
A continuous monorail conveyor with hooks

carries the projectiles through a blast cleaning chamber and spray paint booths to a final station where the bombs and shells are unhooked for return to inventory.

The completely automatic setup was designed by American Wheelabrator & Equipment Corp., Mishawaka, Ind. Cleaning is done by metallic abrasive thrown centrifugally inside the cabinet. No compressed air is required. Workers remain outside the machine during blasting.



RUSTY bombs are hooked on monorail conveyor and head for metallic abrasive blast chamber.



BOMBS emerge from blast chamber with no trace of corrosion, move on for painting.



SPRAYER applies protective paint coat as live projectiles are conveyed through this booth.



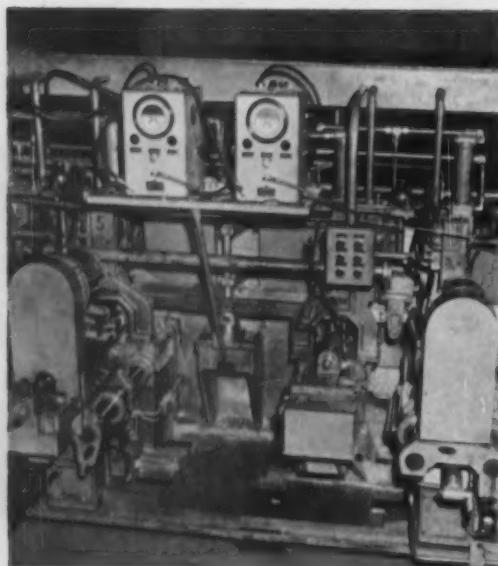
AT THE end of the reconditioning line, projectiles are unhooked for return to inventory.

Minimize distortion—

Transfer Units Machine and Weigh Pistons to Close Tolerances

- Automatic handling of semi-finished and finish-machined pistons has been achieved by Chrysler Corp. through the use of two multi-station, transfer-type machines with many unusual features.
- Production per sq ft of floor space is unusually high . . . A number of special safety features assures continuous operation of the machines and facilitates maintenance.

By W. G. PATTON, Asst. Technical Editor



AFTER wrist pin holes are bored and air gaged on No. 1 machine, pistons move leftward.



LOADING station on No. 2 piston milling and weighing machine automatically positions each part.

♦ MACHINING PISTONS to the weight and size requirements for a modern, high compression V-8 engine is one of the automobile industry's most exacting high production jobs. Ignoring service requirements, a production line turning out 50 V-8 engines per hr would require 400 pistons per hr. At 100 pct efficiency, the new automatic piston machines installed recently at the Chrysler Corp.-Jefferson plant will meet the requirements of a 50 per-hr engine line.

Chrysler's accuracy requirements are high. Wrist pin holes are held within 0.0001 in. The elliptical piston skirt is diamond turned to obtain necessary accuracy and finish. Weight tolerance has been more than cut in half by the new machines and is believed to be the tightest in the industry today.

While a considerable degree of automatic handling of pistons has already been achieved by the motor car industry, it has always been customary to mill the piston to approximate weight and then finish machine. There are logical reasons for following this procedure, including preventing damage to the highly finished machined surface.

One of the two new machines automatically weighs and mills pistons *after* finish machining, processing the parts at rates as high as 400 per hr. This new machine replaces an earlier operation in which milling-to-weight required manual handling of each piston. Finish machining required additional manual handling.

Experience at Chrysler indicates the unusually close weight tolerance achieved in the new setup has cut rejection costs. Cost of engine balanc-

ing, both at the Jefferson plant and in service, has also been reduced.

The new piston machines built by LaSalle Tool, Inc., Detroit, were designed to permit certain manual operations such as diamond boring the wrist pin hole and diamond turning the piston skirt. When the equipment was designed, provision was made to permit further automation, if desired. Only minor changes in the machines will be required by a change in piston design.

The manner of loading machine No. 1, a 16-station, fully automatic setup, was designed to insure proper insertion of the part. Wrist pin holes on Chrysler pistons are offset 0.060 in. If the part is loaded improperly, it is automatically rotated 180°. A check is also made to make sure a qualified part has been loaded. If, after two tries of a feeler pin, proper contact is not made, the machine stops automatically.

To avoid damage to pistons and permit proper positioning, as well as to provide for future automation, the shuttle bars have 8 distinct motions. Each bar automatically drops down to position, engages a piston, raises it vertically and moves it forward to the next station where it is lowered into position. After clamps are in place, the shuttle bars rise vertically and return to their original positions. No rolling or sliding of the piston is involved. The shuttle mechanism is fully adjustable to accommodate future design changes.

Machine No. 1 uses steel fingers to keep the part from turning or swinging. Two machining holes as well as wrist pin holes are also used to locate the part.

The piston is confined at all times but holding pressures are carefully controlled to prevent distortion. Distance between stations is 18 in.

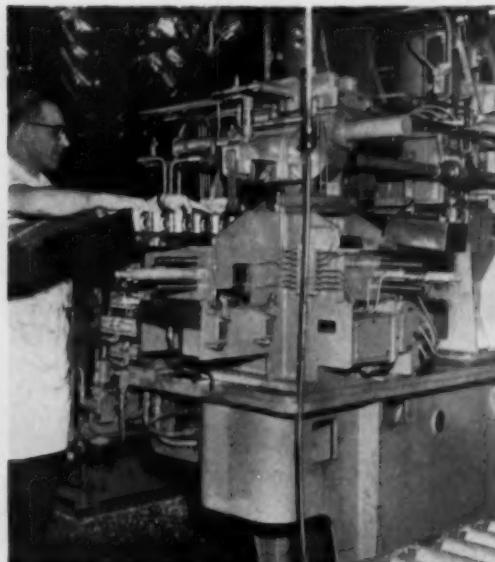
Wrist pin holes are bored at Station No. 2. A single point boring tool is used from each side. After the boring tool has passed through, three chamfering blades perform their operations. The boring tool returns automatically to position.

Following boring, Pratt and Whitney air gage plugs with bullet noses enter the hole. Each plug has 3 orifices. The part is not clamped during gaging but is permitted to float. A blowout removes any chips that may have accumulated.

At Station No. 5, Parker-Majestic boring spindles with offset heads are used to cut snap ring grooves. The tools are hydraulically actuated, positively clamped to depth and positively withdrawn. No springs are used. A counterbalancing device minimizes distortion.

The 2-spindle saw which cuts slots in each side of the piston is fully adjustable.

The entire shuttle mechanism is mounted away from the end of the machine, leaving room to install automatic feeding if future developments should require this feature. This mounting method also permits actuation of the shuttle bars from the middle of the machine.



UNLOADING pistons which have been automatically sorted into over, under and OK weight groups.

Piston Processing Cycle

Machine No. 1

Machine No. 2

Station No.

1. Load
2. Bore wrist pin hole on each side, chamfer
3. Gage
4. Idle (for accessibility)
5. Cut snap ring groove
6. Check location and depth of oil groove
7. Idle (for accessibility, maintenance)
8. 2-splindle saw
9. Idle
10. Mill valve clearance
11. Remove center boss
12. Mill valve clearance and side of piston
13. Idle
14. Check removal of center boss
15. Remove any burrs for valve clearance
16. Unload

Station No.

1. Load
2. Idle
3. Idle
4. Idle
5. Weigh piston
6. Mill-to-weight
7. Blowout chips
8. Idle
9. Re-weigh
10. Sort by weight
11. Unload

"For accessibility and to facilitate loading

Brushes moving up from underneath the part remove any burrs that may result from milling the valve clearance holes.

At Station No. 16 the piston is removed automatically from the shuttle bar.

Lubrication throughout the machine is fully automatic. The three vertical valve clearance milling spindles located at Stations 10, 11 and 12 have a continuous lubrication flow from top to bottom. Sliding members are lubricated periodically. An electrical counting device controls this operation. Oil mist lubrication is used for the boring spindles and saws.

A metal belt conveyor carries chips away through the base of the machine.

Top rollers that carry the shuttle rails are spring loaded. This permits machine operation even though a chip may have been picked up by the roller.

Safety devices built into machine

A number of interesting safety devices have been built into the machine. Every station has air jets built into the fixture to clear away chips. At Station No. 3, an oversize or undersize wrist pin hole stops the machine automatically.

An emergency stop chord runs the entire length of the machine. This permits immediate shutdown if an emergency develops.

Following rough boring, chamfering, cutting snap ring grooves and milling valve clearance, the remaining operations are performed on individual machines. Pistons are manually loaded and unloaded for these operations: (1) Diamond-turn piston skirt to elliptical shape; (2) diamond-bore wrist pin holes.

The piston is then ready for final automatic weighing and milling to weight.

The loading station of the No. 2 piston machine at the Chrysler-Jefferson plant duplicates the setup in machine No. 1. Pistons are again checked automatically both for qualification and loading position. If a workpiece is loaded improperly, it is automatically rotated 180°.

In the No. 2 machine, nylon fingers are used to contain the parts. They keep pistons from turning but do not scratch or damage the diamond-machined piston skirt.

A modified Toledo scale is used for weighing. As the piston is loaded on the scale, the scale is clamped in the up position. After the shuttle releases the piston, a hydraulic cylinder permits smooth but rapid scale settling. Approximately 2 seconds are required for the weighing operation.

Photo tube spots off-weight pistons

A photo-tube arrangement with two electric eyes and two special lenses indicates overweight or underweight pistons. A red pointer memorizes the weight reading. Meanwhile, a white pointer finger "finds" the red finger. This indicates that a wedge adjustment has been made which determines the stop position for the automatic weigh-milling operation.

After weighing, the shuttle bars pick up the piston and transfer it to Station No. 6. The carbide milling cutter here covers the entire ID of the piston skirt and bosses, less 1/32 in.

The machine was designed so that 0.010 in. depth removed by the mill-to-weight cutter represents approximately 1 g.

Another feature contributing to the machine's accuracy is the relatively long, 3 in. weight scale indicator which represents only 30 g.

Four high velocity air jets clear out any chips accumulated during the milling operation.

A number of idle stations were provided in both machines for easier accessibility, and to facilitate cleaning and adjustment as required. The idle stations also permit changes in the machine if future part design changes are made.

Station No. 9 checks all work passing through the machine.

A selector station (No. 10) classifies pistons according to (1) overweight, (2) within specification, (3) underweight. This station is necessary since it is not possible to remove more than 20 g of weight from the present piston design. Also, a piston too light to start with is automatically rejected at this station.

It is obvious that pistons must be held to close tolerances as cast, since all undesired weight is removed at two relatively small areas in these parts.

A plate mounted on the control board of each machine describes the sequence of operations. This simplifies the job of cycling the machine manually if such a check becomes necessary.

NO SIDE LINE



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New Technical Literature:

Catalogues and Bulletins

Electrodeposition

Laboratory analysis via electrodeposition of elements is described in this new 12-page fully illustrated bulletin FS-250 just published. *Fisher Scientific Co.*

For free copy circle No. 1 on postcard, p. 137.

Automation systems

Application and engineering data on standard Sheffield control units for automatic machine control is described in this 12-page catalog illustrated with photographs and schematic diagrams. *The Sheffield Corp.*

For free copy circle No. 2 on postcard, p. 137.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 137.

Packing data

Types of packings used for the many hydraulic and pneumatic installations found in the steel industry are described in a new bulletin now available. Suggestions for

use of leather, rubber-impregnated leather and fabricated duck and rubber types are discussed. Engineering recommendations for the various types are also supplied. *E. F. Houghton & Co.*

For free copy circle No. 3 on postcard, p. 137.

Machining

Milling machine efficiency was foremost in design and engineering of the new milling machine equipment described in this booklet. The new model CE is the direct result of exhaustive surveys of production facilities, tooling requirements and other manufacturing needs. The machine combines accuracy, rigidity and capacity as fundamental design factors. *Kearney & Trecker Corp.*

For free copy circle No. 4 on postcard, p. 137.

Curtain wall

The curtain wall story is the topic of this new bulletin. The bulletin fully describes the new techniques and improved equipment being used to field assemble insulated metal curtain and sandwich walls at substantial savings in cost. May be of interest to architects, engineers, contractors and building owners. *Nelson Stud Welding Div., Gregory Industries, Inc.*

For free copy circle No. 5 on postcard, p. 137.

Molded plastics

Technical data on custom-molded parts of the new Ace glass-reinforced plastics are now given in Bulletin GRP-1. New high-pressure molding techniques which permit economical production of complicated shapes with metal inserts are described. Data are given on matched-die metal molding for mass production of relatively simple shapes with uniform cross-sections also. *American Hard Rubber Co.*

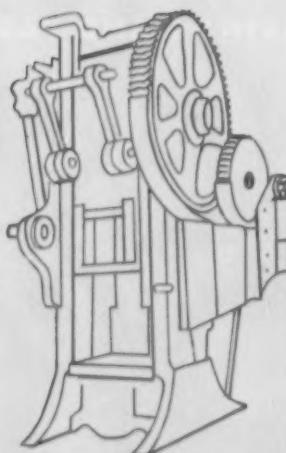
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FREE TECHNICAL LITERATURE

Oxygen mask

A newly designed mask which supplies fire fighters and industrial workers with oxygen or air as desired has been announced by this company. The mask is available in two models. Either combines a supply of air or oxygen with a demand regulator to provide 30 minutes service in highly toxic or oxygen deficient atmospheres. *Mine Safety Appliances Co.*

For free copy circle No. 7 on postcard, p. 137.

Check the facts

One hundred characteristic facts of the new line of Reliance Totally-Protected ac motors are described in this new booklet. It is an aid to engineers and designers in checking design facts of this complete and integrated new line of ac motors. *Reliance Electric & Engineering Co.*

For free copy circle No. 8 on postcard, p. 137.

Tube burring tool

A handy tube burring tool is the newest addition to the Parker line of tube working tools. It can be used for both internal and external burring and can handle copper, brass, aluminum alloy or annealed steel tubing in sizes from 3/16 through 1 1/2 in. outside diameter. *Tube & Hose Fitting Div., Parker Appliance Co.*

For free copy circle No. 9 on postcard, p. 137.

Stainless valves

Seventy-five questions and answers about the selection and maintenance of stainless steel valves are contained in this technical paper. The article covers selection of materials, data on new materials, service and installation problems, as well as information on valve repair. *Cooper Alloy Foundry Corp.* For free copy circle No. 10 on postcard, p. 137.

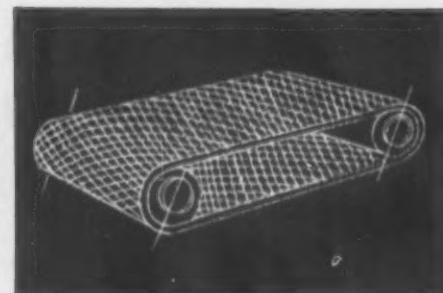
Cataract quench

The cataract quench furnace has definite advantages in many austempering and martempering applications. A new bulletin points up some of these advantages, including: Higher and More Uniform hardness, negligible distortion, increased toughness and ductility. *Ajax Electric Co.*

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Turn Page

HOLCROFT and the CONVEYOR FURNACE



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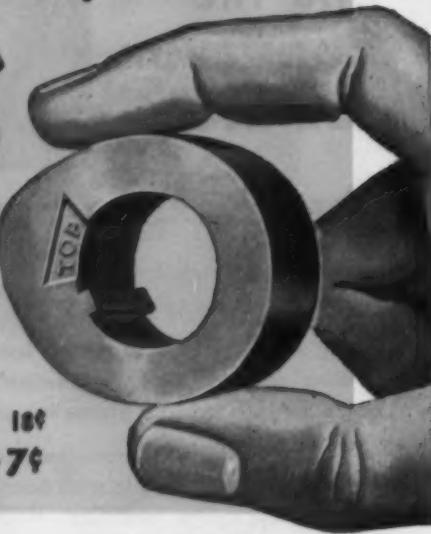
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FREE TECHNICAL LITERATURE

Containers

Re-usable containers and special products are discussed in this new technical bulletin. The booklet describes how advantages can be gained by packaging, storing and shipping industrial materials in scientifically constructed re-usable metal containers. The lightness and compactness of the design is stressed. *Peters-Dalton, Inc.*

For free copy circle No. 12 on postcard, p. 137.

Bronze electrodes

An up-to-date bronze electrode comparative chart has recently been prepared listing all known brands of aluminum bronze, phosphor bronze, nickel-aluminum bronze and manganese bronze electrodes on the market. It will prove most helpful in electrode selection. *Ampco Metal, Inc.*

For free copy circle No. 13 on postcard, p. 137.

Laminations

A new series of EI type laminations for three phase, 60 cycle per second transformers are described in Bulletin L-155. Substantial savings may be realized through the use of EI type laminations, and their use in industry has grown rapidly because of increasing growth of three-phase power applications. *Thomas & Skinner Steel Products Co., Inc.*

For free copy circle No. 14 on postcard, p. 137.

Temperature recording

Complete information about the new Speedomax Type H indicators, recorders and controllers is contained in a new series of data sheets. The new instruments can be used to indicate or record temperature, or to provide two-position or one of three types of proportion control. *Leeds & Northrup Co.*

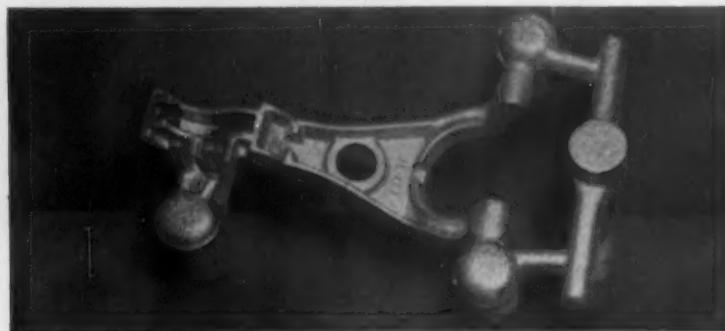
For free copy circle No. 15 on postcard, p. 137.

Cutting torch

Many detailed on-the-job reports on the use of a cutting and gouging torch are shown in this new case history booklet which is offered to any company or individual interested in learning more about the Arcair process. *Arcair Co.*

For free copy circle No. 16 on postcard, p. 137.

Shrink steals strength — and profits



— RADIOGRAPHY
points the way to avoid it



THIS steel fork lever was designed to take a specific load. Would it hold up? Not if shrinkage had robbed its strength.

But here is where radiography came in with double-barreled effect. First the radiographs which were made showed the foundryman that

internal shrinkage was present. Then the radiographs disclosed a recurring pattern of these defects, thus suggesting a change in molding which greatly reduced the difficulty.

This is typical of the ways radiography helps the foundryman make sure only satisfactory work is de-

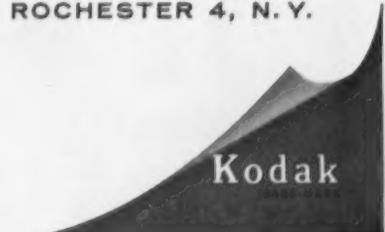
livered and so builds a reputation for high-quality castings.

If you'd like to know how it can improve your own operations, talk it over with your x-ray dealer. Or, if you like, write us for a free copy of "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY, X-RAY DIVISION, ROCHESTER 4, N.Y.

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 132

Metalfinishing

If you have a metalfinishing problem you can use this comprehensive collection of technical data sheets. There are 35 of them, bound in an attractive cover. They offer helpful material on many of the technical problems and processes encountered in day-to-day operation of a metalfinishing plant. Samples: Electroplating on aluminum, anodizing and derusting, reverse current cleaning of steel. *MacDermid, Inc.*

For free copy circle No. 17 on postcard.

Vapor degreasing

"What You Should Know About Vapor Degreasing," is the title of a new, comprehensive booklet outlining principles and equipment involved in this process. Chapters on the solvent cycle, vapor degreasing, vapor-spray-vapor degreaser, and liquid-liquid-vapor degreaser are included. Many illustrations. *Metalwash Machinery Corp.*

For free copy circle No. 18 on postcard.

Ordering collets

Here is a helpful and very complete collet selection guide for all lathes, mills and grinders. It's designed for tool engineers, purchasing agents and others requiring precise collet ordering information. Includes specifications, dimension charts, conversion and interchangeability listings. *Hardinge Bros., Inc.*

For free copy circle No. 19 on postcard.

Sandblasting

Modern sandblast equipment for many purposes is described in this new booklet. Covers equipment from laboratory scale to full production models. Includes complete details of dimension, construction, work range and operations which can be handled on a variety of materials. *Leiman Bros., Inc.*

For free copy circle No. 20 on postcard.

Armored motors

If you have an application where armored motors are specified, you'll be interested in this book. It tells the technical story on the application of armored motors and contains vital information of interest to engineers and to management. *General Electric.*

For free copy circle No. 21 on postcard.

Cleaning and finishing

A complete discussion of the advantages of precision cleaning and finishing is presented in a comprehensive new brochure. Dealing with the wet abrasive blasting process, it presents 40 frequently-met applications in which this process can be profitably used. A description of the process and necessary equipment is included. *American Wheelabrator & Equipment Corp.*

For free copy circle No. 22 on postcard.

Cam follower bearing

A new four-page bulletin describes design and performance features of Camrol cam follower roller bearing. *McGill Mfg. Co.*

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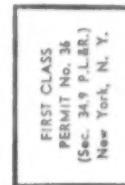
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FREE TECHNICAL LITERATURE

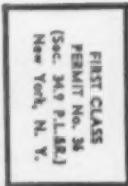
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Hydraulic jacks

There are plenty of places around the plant where hydraulic jacks can help cut manpower requirements by putting greater power in the hands of the men who need it most. This new bulletin describes the Simplex Re-Mo-Trol hydraulic unit which has a 50 ton capacity. *Templeton, Kenly & Co.*

For free copy circle No. 24 on postcard.

Self lubricating bearings

Both designer and engineer will be interested in this 40-page book on oilless and self-lubricating bearings. Covers a complete range of bearings and bearing materials from sintered bronze and steel to oil impregnated wood bearings, pillow blocks with sintered bearings and others. *Wakefield Bearing Corp.*

For free copy circle No. 25 on postcard.

Angle dresser

The angle dresser and tool holder described in this new bulletin will find many uses in your plant. It's engineered to meet exacting shop requirements and embodies all the elements required for angle trueing wheel dressing service. It also serves as an efficient, sturdy and accurate tool holder. *Rothfuss*

For free copy circle No. 26 on postcard.

Colloidal dispersions

How colloidal dispersions have been used successfully for dry-film lubrication is described in this new bulletin No. 438. It offers latest information on materials processed to colloidal size and dispersed in suitable carriers. *Acheson Colloids Co., Div. of Acheson Industries.*

For free copy circle No. 27 on postcard.

Broaching machines

A complete line of single-ram surface broaching machines are described in a recent bulletin released by Colonial Broach Co. Charts tabulate the dimensions and specifications of the entire 11-machine line. Blue print type line drawings show all three views of a typical machine. *Colonial Broach Co.*

For free copy circle No. 28 on postcard.

FOR MORE LITERATURE

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Electrification

Insul-8-Bar enclosed conductor systems for the safety electrification of cranes and monorails are described in a new catalog. The booklet explains the principles of these insulated systems and shows why they meet all crane and monorail requirements without the need for special engineering. An illustrated parts list, engineering data and other pertinent information is also included. *INSUL-8-Corp.*

For free copy circle No. 29 on postcard.

Hydraulic fluid

A new 20-page booklet includes a step-by-step check list for converting to Pydraul F-9, a fire-resistant industrial hydraulic fluid. It also gives detailed information on properties and performance of the fluid and lists a variety of equipment and industries in which Pydraul has been used. *Monsanto Chemical Co.*

For free copy circle No. 30 on postcard.

Pressure valves

High pressure electric valves, designed to handle pressures to 3000 psi and using standard alternating and direct current voltages, are described in this new bulletin. Valves are globe type, pilot operated, piston actuated with only three moving parts. *Atkomatic Valve Co.*

For free copy circle No. 31 on postcard.

Welding supplies

A new catalog covering a complete line of arcwelding and oxyacetylene welding supplies and accessories is being offered by Air Reduction. *Air Reduction Sales Co.*

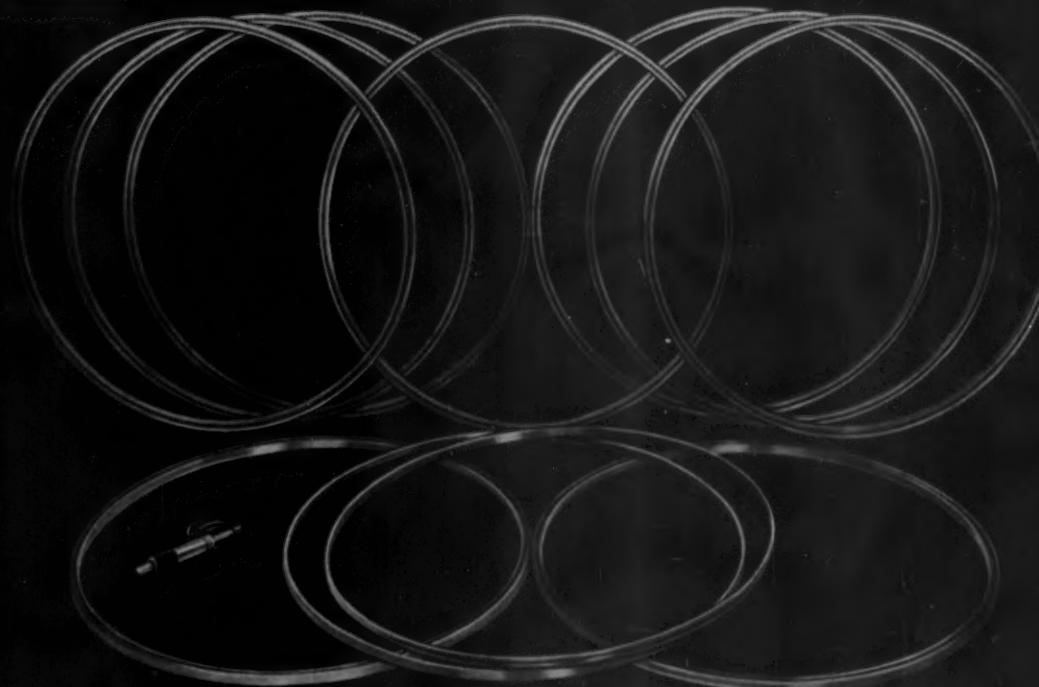
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FOR ALL TYPES OF BALL AND ROLLER BEARINGS: 4" BORE TO 120" OUTSIDE DIAMETER

KAYDON BALL RADIAL BEARING — 16.875" x 17.625" x 0.375"
DESIGNED FOR PRECISION RADAR MOUNTS



ACTUAL SECTION: ONLY $\frac{1}{4}$ " x $\frac{1}{8}$ "



NET WEIGHT: 1 pound, 10 ounces

KAYDON REALI-SLIM--World's thinnest bearings provide precision answer for electronic applications

Precise Thin-Section bearings on a production basis! That's why the electronics industry makes **KAYDON** its headquarters for extra-light, thin-section bearings. A perfect example is this Real-Slim 16.875" x 17.625" x 0.375" ball radial bearing.

If you're manufacturing electronic equipment that includes rotating parts, there's a Real-Slim bearing designed to meet your requirements starting with $\frac{1}{4}$ " cross section and $\frac{1}{8}$ " width—either in small or large diameters.

Fortified with engineering know-how, years of manufacturing skill and electronic application experience, **KAYDON** has modern facilities for metallurgical analysis,

microscopy, physical testing, atmospheric controlled heat treating, hardening, as well as sub-zero stabilizing. This all adds up to more compact, more precise, lighter equipment with built-in long life and precision.

For unusually small or large Real-Slim bearings for electronic applications, contact **KAYDON** of Muskegon.

GET THIS CATALOG!

24-pages of engineering and application data — specifications on size, seals, separators and design ideas. Ask for **KAYDON** engineering catalog No. 54.



KAYDON Types of Standard and Special Bearings:
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PRECISION BALL AND ROLLER BEARINGS

TECHNICAL BRIEFS

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DUST CONTROL means each machine has its own custom-tailored dust collector designed to work specifically for that machine. There is no guess work, or average suction. Furthermore, dust control is provided only when that machine is running . . . there is no waste of power such as you have with centralized control when only a few machines are operating. This means better dust control at lesser operating cost and less initial installation cost. Get the facts now on how Torit will work better to . . . "CLEAR THE AIR".

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DIAMONDS: Made In A Pot

Tiny but authentic diamonds have been produced at the Knolls Research Laboratory of General Electric . . . Secret of the process is in the controlled use of super pressures and temperatures.

• NEW FRONTIERS in high temperature-superpressure research have been reached at General Electric Co.'s Knolls Research Laboratory, Schenectady, where a process for manufacture of "man-made" diamonds has been developed.

The diamonds, identical in hardness and structure to natural diamonds, weigh from 1/100 to 1/10 of a carat. Largest diamond produced to date measures 1/16 in. on its longest dimension.

Source for Industrial Diamonds

Adaptation of the process on a commercial basis would have far reaching effects on the metalworking industry. It would provide a domestic source of industrial diamonds for cutting, grinding and polishing tools. No longer would American industry have to depend on foreign sources of supply during an emergency period.

If produced at prices substantially below those of current industrial diamonds, wider application of diamonds as a cutting material could result.

Of even greater importance will be the knowledge the company is gaining of how materials react under extreme temperature and pressure conditions. Changes in materials' structures may result in

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 137. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

properties unknown at this time. The company has already produced a higher density quartz.

To produce diamonds, the carbonaceous material is placed in a vessel in a 1000-ton press and subjected to a pressure of 1.5 million psi and 5000°F and held under these conditions for varying amounts of time according to the type of diamond desired. To produce the 1/16 in. long diamond took 16 hours under pressure and temperature.

The 1.5 million psi exerted in the cylinder is roughly equivalent to that which exists 240 miles below the earth's surface.

Research:

Portable cabinet increases
tensile machine versatility.

Testing temperatures ranging from 100°F to 400°F were made possible recently at Glenn L. Martin Co., Baltimore, by a new portable controlled-temperature cabinet. The cabinet was designed by Baldwin-Lima-Hamilton engineers for testing machines of three capacities up to 400,000 lb.

Both tension tests and compression tests are performed in the cabinet, and stress-strain curves are produced automatically.

Two heat-insulated hand holes and a window in the door of the



Men making diamonds . . .

TECHNICAL BRIEFS

cabinet permit manipulation of grips, extensometer, thermocouple, or other accessories inside while tests are in progress at elevated or sub-zero temperatures.

A wide variety of aircraft materials are tested in the cabinet, including new metallic materials, reinforced plastics, metal-to-metal bonded structures, and adhesive bonded honeycomb assemblies.

Profiling:**Woodworking machine uses carbide to cut steel.**

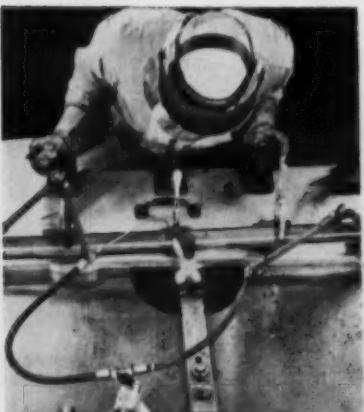
A woodworking machine has been adapted with carbide tooling for profile milling the edges of 155-in. long steel closure ribs for large aircraft. The job is done efficiently and economically on a spindle shaper by using a carbide-tipped, 1 1/4-in. diameter three-flute special end-mill. Cutting speed is 2062 sfpm.

Clever adaptation of this woodworking machine permits accurate machining of the modified SAE 4340 (40-42 Rc) workpieces.

Clamped to Fixture

The closure ribs, 3/32 to 1/2-in. thick, are clamped to an aluminum fixture whose edge is accurately machined to the required rib contour. This edge acts as a template and rides along an Ampco bushing mounted on the cutter shank. This permits the desired profile to be generated on the workpiece.

Two in-line machines, with a



Uses carbide tooling . . .

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SUPERIOR SERVICE**
... coast to coast

TOWMOTOR
THE ONE-MAN-GANG
FORK LIFT TRUCKS
**YOUR TOWMOTOR
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New TOWMOTOR Roll Clamp upending multi-ton paper roll

**FAST
DEPENDABLE
SERVICE**
when you need it!

Every Towmotor fork lift truck is designed to stay on the job longer. However, abuse, or years of service eventually make repairs necessary. That is when Towmotor's easy service accessibility pays off. Each Towmotor Representative is a materials handling specialist who backs up the Towmotors he sells with the most efficient and complete service facilities in the field. Talk to him about the advantages of Towmotor 3-way Service. See your Towmotor Representative today, and write for complete service information. **TOWMOTOR CORPORATION, DIV. 1503, 1226 E. 152nd St., Cleveland 10, Ohio.**

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REPRESENTATIVE**

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Arcos FOR FINEST QUALITY WELDS



Cooking up some profitable benefits for food processors

Processing tomato juice or apple sauce . . . vinegar or chicken soup—cooking kettles *must* be "stain-proof". Stainless welds in particular must be chemically "right", physically sound. On both counts, because of careful quality control, Arcos Stainless Rods and Electrodes produce welds with these requirements.

If corrosion resistant welds are essential to the processing equipment you make or use, you'll profit with Arcos. Here's why: Expensive trial-and-error selection is avoided. There's a properly formulated grade for each job. Costly rewelding is eliminated. The rigid quality standards in manufacture assure you consistent and dependable weld metal. And Arcos technical service adds extra promise of the results you want. On any corrosion resistant welding problem, get in touch with your Arcos distributor or Arcos Corporation, 1500 S. 50th St., Phila. 43, Pa.

WELD WITH
 **Arcos**
 STAINLESS RODS AND ELECTRODES

roller conveyor between them, are used for this operation. The clamped workpiece is hand-fed into the first or roughing machine which takes a cut to 3/32 to 1/2 in. depth at 4500 rpm. On this machine the shank-mounted bushing is about 1/8 in. larger in diameter than the Kennametal K2S cutter. This leaves about 1/16 in. stock for finishing.

Slides Across Machine

The workpiece is then slid across to the finishing machine on which the bushing and cutter are the same diameter. It requires only two minutes to complete each cut. Floor-to-floor time for rough and finish machining an edge is approximately 20 minutes. An estimate of floor-to-floor time for doing the same operations on a standard profiling machine is about 10 hours.

During the cutting cycle two coolant streams of CO₂ are directed at the cut. Life per grind of the 1 1/4 in. diameter end mill is 2 cuts on roughing and 5 to 8 cuts on finishing.

Electronics:

Machine processes payroll,
solves engineering problems.

Scientists at the Missile Systems Div. of Lockheed Aircraft Corp., have received an electronic assistant to help them with their many engineering problems. It is a new type of electronic data proc-



Installing computer . . .

TECHNICAL BRIEFS

essing machine which in addition to the solution of high-powered scientific problems will handle such tedious, complex office work as calculating the payroll.

The unit is a Type 650 magnetic drum machine, made by International Business Machines Corp. of Endicott, N. Y. The Lockheed machine is the first of its type to go to the aircraft or missile industries. The company expects to ship more than 400 of the machines within the next two years.

Computes Flight Paths

During most of the week the machine will be working for Lockheed's guided missile engineers, computing flight paths for fully-guided missiles by numerical simulation of control systems and autopilots. It will calculate heating effects at extremely high speeds and help with upper-atmosphere research.

The machine will also be applied to design studies and perhaps even computation of orbits for space vehicles. The machine will provide answers to problems that are otherwise virtually unsolvable or would consume valuable hours on lesser machines.

Checks For Errors

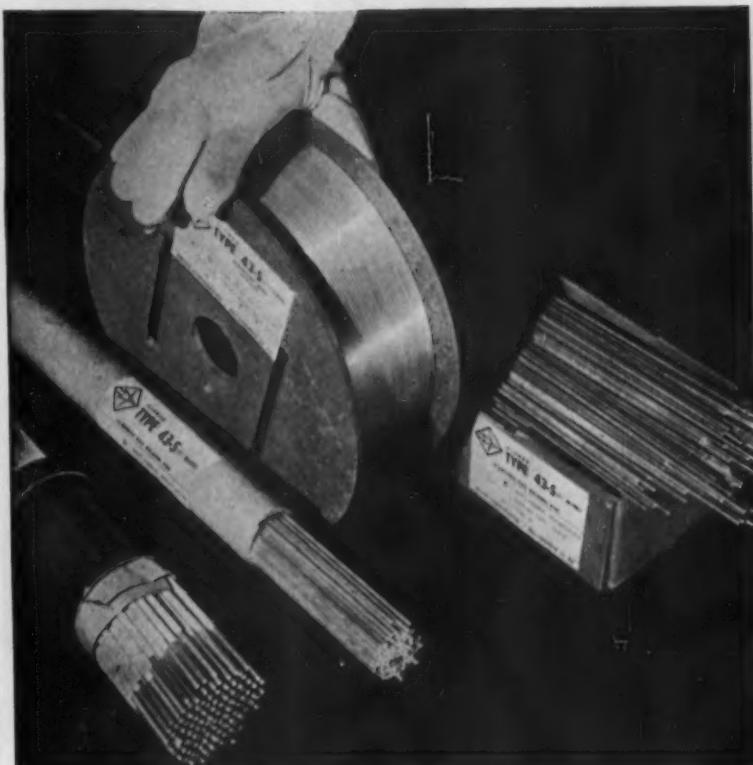
For one hour each week, the machine will handle Lockheed Missiles hourly payroll of 1500. Each of the nearly one million calculations performed in this hour is automatically checked by the machine to prevent error.

Most important feature of the machine is its magnetic drum memory. It is this that distinguishes the machine from conventional electronic calculators.

Lockheed engineers will use the "memory" to solve complex mathematical equations relating to guided missiles. The operator first programs the machine by feeding into it a series of punched cards which give it operating instructions on how to solve the problem, step by step. Then, by the same method, the operator gives the machine all empirical, or established, data. These data may have been taken from previous experiments or cal-

Turn Page

Arcos FOR FINEST
QUALITY WELDS



NOW AVAILABLE...these NEW Arcos products for welding aluminum

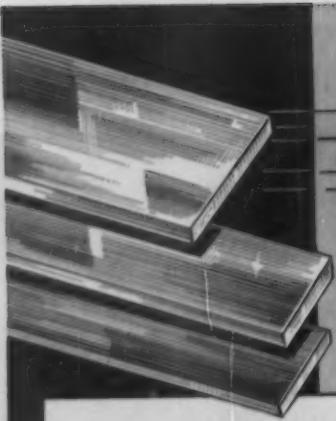
Are you looking for a way to reduce costs and improve results on welding aluminum? Then consider how Arcos may help you:

First, with *new products*. Arcos now offers coated and bare aluminum rods and electrodes in a variety of grades. Also available in coiled, cut and spooled forms. This means accurate selection for each job. Second, with *quality controls*. To get sound welds there's no substitute for the high Arcos standards applied to raw materials and manufacturing procedures. Third, with *technical service*. Helping you get low-cost, trouble-free aluminum welds is a prime responsibility of Arcos. This help is based upon years of experience with weld metallurgy.

To get started, write today for an Arcos Aluminum Application Chart. Arcos Corporation, 1500S. 50th Street, Philadelphia 43, Pa.

 **Arcos** WELD WITH

ALUMINUM RODS AND ELECTRODES



speed

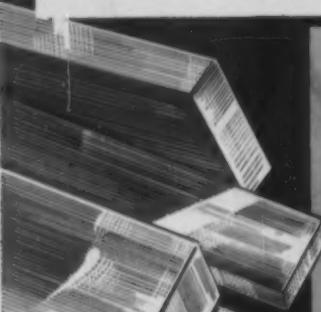
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Cold Drawn CARBON & ALLOY

WIDE FLATS

UP TO 2" x 12"



Wyckoff Precision Wide Flat Sections are cold drawn to close tolerances and will definitely reduce your machining and assembly costs for gauges, gibs and fixtures, machine tool bases, die plates, and other heavy machinery parts.

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- Straight Edges
- Smooth Uniform Surfaces
- Furnace Treatment to Your Specifications



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WYCKOFF STEEL PRODUCTS—Carbon and Alloy
Steels • Turned and Polished Shafting
Turned and Ground Shafting • Wide Flats up to
12" x 2" • All types of furnace treated Steels

culations, or they might be in the form of known constants or tables of mathematical functions.

Uses Punched Cards

The program and the established data are transmitted from the device which reads the punched cards to the magnetic drum "memory." Each number is stored on the surface of the drum as tiny magnetized spots, and each group of spots has an "address" so that any number, either data or instruction, can be called for and made available when needed.

Fabricating:

New T-1 steel available
in wide plate form.

The new T-1 steel is now available in every commercial plate size from Lukens Steel Co. The Coatesville, Pa., firm was licensed by U. S. Steel to produce the new alloy in wide plate form.

Lukens also has matching heat treating and finishing facilities, flanging equipment, and forming dies for production of special items from T-1 steel.

Exceptional Toughness

Developed by modern steel research, T-1 steel has (1) a yield strength 3 times that of ordinary carbon steel; (2) excellent welding qualities without preheating; (3) toughness at sub-zero temperatures; (4) resistance to wear and impact abuse.

In addition to exceptional toughness, the new alloy is relatively inexpensive considering its high strength—costing about 2½ to 3 times more than ordinary carbon steel.

Initial Lukens production will be for general industrial equipment, bridges, earth-moving and construction machinery. The firm will provide technical assistance in the use of the T-1 alloy and advise where it will serve to improve products and reduce over-all costs.

The company claims its ability to roll extraordinarily wide plates, requiring fewer welded seams, offers a saving to customers.

TECHNICAL BRIEFS

AIME:

Large size titanium castings produced successfully.

With forging of titanium and centrifugal casting well on the road, researchers are pushing titanium casting techniques. Latest development is a bottom pour furnace that drops 125 lb liquid melts of titanium down through a protective helium-argon atmosphere to graphite molds beneath the crucible. Castings up to 75 lb in either titanium alloy or pure titanium can be produced.

Two models are in the development stage—one a tilting furnace with fixed crucible, the other a bottom pouring arrangement with a liquid cooled plug.

Titanium Superheated

Melting is done with a pure titanium consumable electrode fed into the crucible from above. This burns through the titanium "skull" lining the crucible at the moment of pouring. The furnaces were described in a report from the U. S. Bureau of Mines last week at the annual meeting of the American Institute of Mining and Metallurgical Engineers at Chicago.

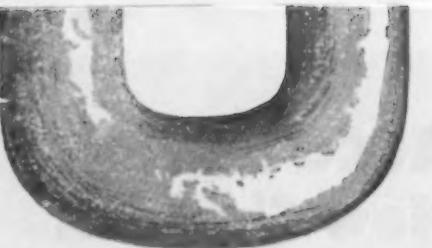
Careful heat control will be necessary to avoid carbon difficulties as higher production rates are attained. Titanium castings will become available in considerably larger sizes than has been the case in the past, it was brought out in discussions at the titanium symposium. Pouring rates should improve, but no all-out production advances are forecast.

No Serious Contamination

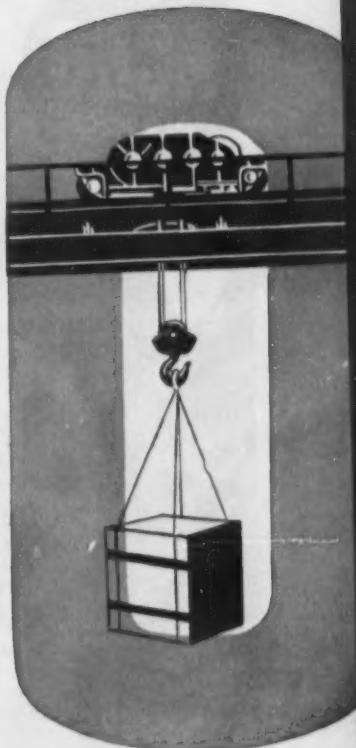
No serious contamination problem has been encountered where titanium electrodes have been used to remelt castings scrapped from previous tests. This applies even where castings have been remelted several times, it was reported.

AEC demand for zirconium is pushing that metal into the lime-light, as the number of operating nuclear reactors grows. Zirconium, with excellent mechanical proper-

Turn Page



important **LINK in AUTOMATION**



A step toward automation is equipment for faster, less costly handling of heavy materials; cranes, custom designed for specific applications. Conco engineers can design such cranes — the right lift, the right speed, the right clearances. Thirty seven years experience are behind every Conco Crane recommendation. Request a Conco representative to call and discuss your problem. Or, write for Bulletin 3000A covering the complete Conco Crane line.

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ACCO's Great New Chain...

ACCOLOY

X-WELD

125

• At last—a chain with welds as strong or stronger than the material . . . welds that won't break when links are bent sharply . . . welds made with two projecting lugs that absolutely prevent dangerous kinking of the chain . . . welds that provide $2\frac{1}{4}$ times the welded area found in normal flash or butt-welded links.

Accoloy X-Weld 125 Chains hang straight as a die. Every link is perfectly formed!

Accoloy X-Weld 125 Chain has almost countless uses: Slings, bundling, towing, general utility chains . . . It can be furnished in special analyses and heat treatments to provide greatly extended life and use on tough jobs . . . corrosive jobs . . . abrasive jobs . . . hot jobs. Specify Accoloy X-Weld 125 for your next chain job for a new concept of chain performance, economy and value. Available in $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ " and $\frac{3}{4}$ " sizes.

• Ask our nearest district office for further information on ACCOLOY X-WELD 125 CHAIN, or write the American Chain Division, York, Pa., for descriptive bulletin.

The Secret is
in the Weld!

This Accoloy X-Weld 125 link was ground and etched to show its big welded area— $2\frac{1}{4}$ times the size of welded area possible with other welding processes. This means more than double the security of the weld—and only X-Weld has it!

American Chain Division

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Los Angeles, New York, Philadelphia, Pittsburgh,
Portland, Ore., San Francisco, Bridgeport, Conn.

ACCO



for
Better
Value

ties and corrosion resistance, as well as low thermal neutron absorption, is scheduled for an increasingly important role.

Zirconium Production Grows

From Carborundum Metals Co.'s still growing 150,000 lb per year plant near Buffalo came a production report on zirconium, a laboratory curiosity in the recent past.

The Carborundum plant reduces zircon sand to a zirconium carbide, then chlorinates the carbide. The resulting zirconium tetrachloride is chemically treated and reduced to an oxide. Zirconium oxide is briquetted, again chlorinated, then furnace reduced under a helium atmosphere.

The zirconium sponge produced is cut from the crucible, crushed, tested and packed for shipment. The process used was evolved by Dr. Kroll of the U. S. Bureau of Mines.

Titanium:

High vacuum anneal
removes hydrogen

A high vacuum annealing process removes hydrogen from titanium and greatly increases its tensile strength and ability to withstand the stresses of supersonic flight. The process, recently utilized for making jet plane parts, is now available to all manufacturers through a new company, Kinetics Corp. of Boston.

On Production Basis

The firm's sole business is high vacuum annealing of titanium, zirconium, or other active metals on a production basis. Its high vacuum furnaces are specially designed to accommodate coils, strips, wire, formed pieces, castings and billets.

According to tests, tensile strength of some titanium can run as low as 60,000 psi when small amounts of hydrogen are present. By removing the hydrogen tensile strength can be increased up to 160,000 psi. High vacuum annealing also increases ductility and fatigue resistance.

TECHNICAL BRIEFS

Drilling:

Multiple spindle machine cuts production costs.

Specially - designed multiple spindle drilling machines are permitting marked reductions in the costs of producing jet engine fuel controls at Hamilton Standard division of United Aircraft Corp., Windsor Locks, Conn.

This company manufactures the fuel controls for several of the latest military jets, ranging from supersonic fighters to the eight-engined Boeing B-52 intercontinental bomber.

Nine Times Faster

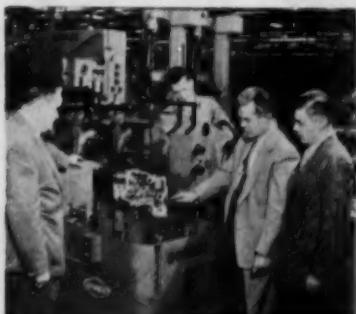
Replacing smaller type drill presses, the new multiple spindle machines enable Hamilton Standard to drill housings for the fuel controls about nine times faster than formerly and at about 90 pct less cost for these operations.

New machines drill a total of 110 holes in 17 operations. Often holes of this type, which vary in diameter from $\frac{1}{4}$ in. to $\frac{3}{4}$ in., are drilled in single operations.

Bigger Machines Planned

The planning and development of the drilling machines by Hamilton Standard's production engineering section, working closely with manufacturers of the multiple spindle devices, has resulted in installation of 17 of the machines.

Steps are now being taken to develop other machines for the speedier drilling of some 50 additional holes not yet included in the multiple spindle operations.



Production time cut . . .



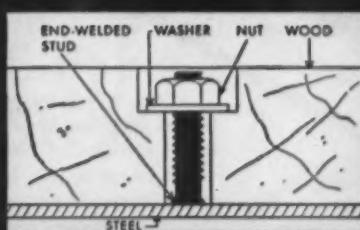
"STUD" NELSON

FASTENS

**WOOD to STEEL
IN A FLASH!**

Shipyards and railroads have long been users of the NELWELD system of securing wood decking—and builders fasten wood nailers the same way.

In like manner, designers of skids, pallets, dollies and other wood-and-steel products are also benefiting by the NELWELD® method. End-welded studs are a "natural" in designing outside surfaces free from bolt heads and projections—saves drilling and tapping the steel members, too.



The pay-off is—NELSON® studs are made in many other different sizes and shapes—allowing design flexibility you never believed possible.

The aim of every Nelson Engineer is to improve fastening and reduce cost. He will arrange a demonstration in your plant or furnish a trial rental unit. Write or phone for details.

NELSON

*Fasten it Better
at Less Cost*
with



NELSON STUD WELDING

2736 Toledo Avenue
Lorain, Ohio

Please send more information on stud welding
wood to steel, and other cost-saving applications.

NAME _____

COMPANY _____

ADDRESS _____

CITY AND STATE _____

NELSON STUD WELDING DIV. OF GREGORY INDUSTRIES, INC. **LORAIN, OHIO**



G.O.
CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

Marking:

Hydraulic marking machine
letters large parts.

Marking machines are usually considered in the light or medium machinery class, however, there is no limit to the range or capacity of hydraulic units which can be built. The size of this type machine is governed only by the handling and conveying equipment to the machine. Units of this type can be installed in the production line and parts conveyed to it from the preceding operation by conveyor, hoist or crane.

Geo. T. Schmidt, Inc., Chicago, Ill., is the designer and builder of a large hydraulic giant radial marking machine. It is one of several marking machines installed in a large midwestern plant and is used to roll lettering radially on aluminum and stainless steel forgings up to 28 in. in diameter and ranging from $1\frac{1}{4}$ to $8\frac{3}{4}$ in. thick.

Adjusts For Thickness

This machine uses a specially designed radial marking fixture with adapters to accommodate the range of sizes. A knurl or roll type holder which will take interchangeable lettering tools is employed to roll lettering radially on the face of the forging.

Because the machine provides a



Simplifies marking . . .

TECHNICAL BRIEFS

hydraulic cushion, variations in thickness are compensated for to produce a clean, sharp impression of uniform depth. The size of the parts and characters impressed necessitates equipping this machine with a slow action die slide.

Tool, Work Move Together

The operator steps on foot pedal which raises table, fixture and work into register with the lettering tool. The rotation of the tool revolves the marking fixture and work. A handwheel at operator's control position adjusts location of work in and out in relation to the lettering tool. A handwheel at the front of the machine beneath table and fixture is a manual adjustment for table rise.

The machine is powered by a 7½ hp motor and develops up to a maximum of 30,000 lb table pressure.

Welding:

Process simplifies joining hard-to-weld metals.

Hard-to-weld, industrially important materials such as titanium, the super-alloys, aluminum or air hardening steels can now be fabricated readily by a new welding process. The K-Weld process, developed by M. W. Kellogg Co., a subsidiary of Pullman, Inc., exerts precise control over the application of the root bead through the process itself rather than the skill of the operator.

In this process inner and outer inert-gas shielded arc welding is used in applying the initial or root bead to the joint being made up. Accurately controlled gas pressure inside pipe or weldment permits depositing a weld of uniform internal contour. By varying gas pressure, the inner surface of the bead can be made slightly convex, flush, or even concave.

Meets Many Specifications

Weld quality obtained by this process meets all x-ray, physical, and mechanical requirements of the ASME Boiler Code, and other

Turn Page

**Shuts Doors, Windows, Stops Conveyors
Sounds Alarm...**



Randolph EXTINGUISHING SYSTEMS

Where your fire hazards are severe and areas are large or inaccessible . . . play safe! Be ready and secure with a fast action Randolph Automatic Fire Extinguishing SYSTEM!

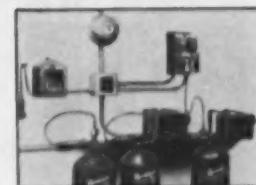
At the first spark or flicker of flame . . . hundreds of pounds of powerful, non-damaging carbon dioxide flood the entire area . . . reach into every corner . . . stop the toughest fire . . . all automatically . . . all in a few seconds!

Thermostats set off alarms and immediately release a fire killing charge of CO₂ from stored cylinders through pipelines to overhead nozzles . . . the CO₂ charge smothers the fire with a heavy snow blanket. This charge can also shut doors, close windows, shut off motors, fans, conveyors, gas lines and close ducts . . . all automatically.

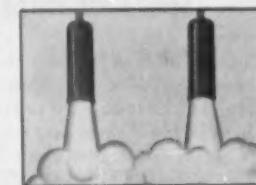
Send for Randolph's free FIRE HAZARD IN'DEX recommending the correct equipment for protection against any of the 580 typical fire hazards that might exist on your premises. Randolph's System Engineering Service is also available without cost or obligation. Write today: Randolph Laboratories, Inc., 9 E. Kinzie St., Chicago 11, Ill.



A fire! And the sensitive detector sends current to an alarm and storage tanks!



Doors and windows close . . . conveyors stop automatically. Powerful carbon dioxide pours through the feed lines.



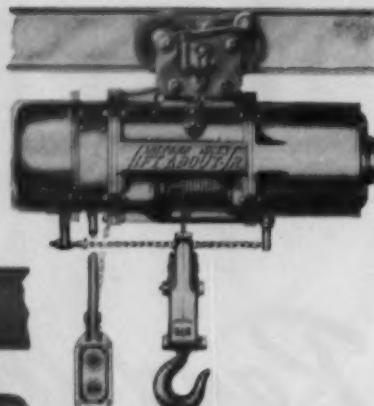
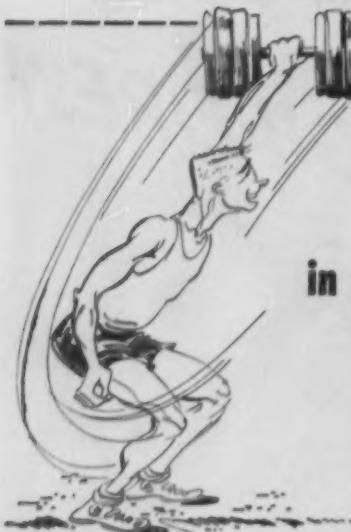
Giant-size "CYCLONE" nozzles deliver the fire-killing punch . . . flood the entire room in 15 seconds!



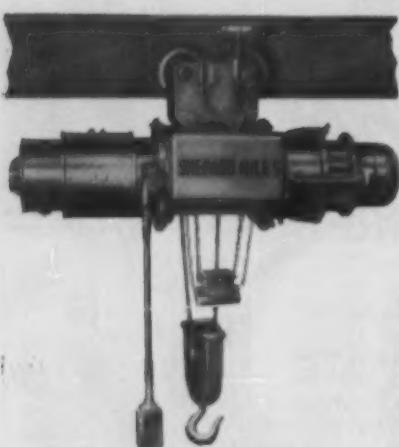
SHEPARD NILES

LIFTING CHAMP

in the electric hoist field



Medium-Service *LIFTABOUT Jr.*



Heavy-Duty **SHEPARD NILES** Hoist

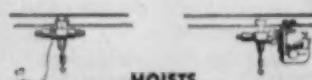
Send for Bulletin illustrating the complete line of Shepard Niles Hoists . . . request a representative to call. He'll show you why Shepard Niles is your best buy in electric hoists today.

YOU GET A HOIST that will lift your loads year after year when you buy one bearing the Shepard Niles name. Long after you've written it off, your Shepard Niles Hoist will be cutting costs, speeding work in your plant.

Shepard Niles offers you electric hoists of proven quality for cycle duty, heavy intermittent duty, medium duty and light-occasional service. Choice of medium and heavy capacities with slow, medium and fast speeds. Available with short to long lifts, standard or close headroom . . . manual or magnetic controls.



America's Most Complete Line of Cranes and Hoists since 1903



Operated from Cab,
Floor or Pulpit.

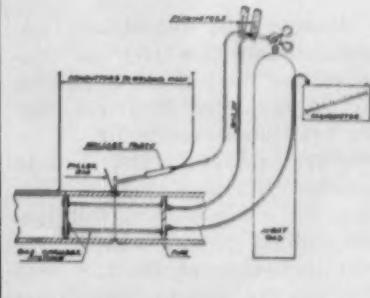
SHEPARD NILES
CRANE AND HOIST CORPORATION

1460 SCHUYLER AVE., MONTOUR FALLS, N.Y.

codes and specifications, it is claimed. Tensile, bend, impact and torsion tests have demonstrated excellent properties. Complete metallography has revealed that there is no tendency for cracking or under-cutting the edges of the inside bead.

Although first used commercially in the shop fabrication and field installation of high pressure, high temperature stainless steel power piping, the process is being applied successfully to many other difficult welding applications. It is applicable to any metal or alloy which can be fusion welded.

Welds produced by this process in heat-treatable steels such as SAE 4130 have withstood the drastic quench necessary to produce yield strengths in excess of 150,000 psi, it is reported. Other materials such as carbon and carbon molybdenum steels, chromium molybdenum steels, nickel, monel, inconel, and copper have been successfully welded by this process.



Equipment setup . . .



Simplifies welding . . .

that's the ticket!

Piercing:

Permanent magnets align work, reduce scrap.

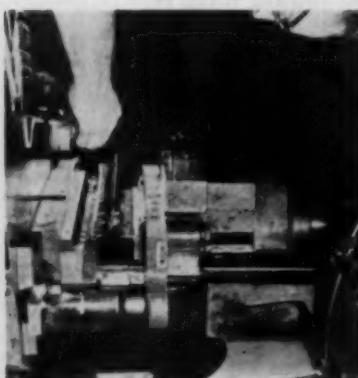
Piercing thin gage steel is usually a simple production procedure. It is so simple that it is an easy matter to produce scrap—if accuracy is involved—if the job is long-run and, if the operator is not constantly alert.

At Hart & Cooley Mfg. Co., Holland, Mich., where just such an operation existed, two permanent magnets strategically located in the press die took all the "ifs" out of the job. Both guesswork and scrap were eliminated 100 pct.

Operating Procedure

The company manufactures warm air heating and air-conditioning registers and grills and diffusers of all types. An 85-ton piercing press punches holes in register frame sections. The holes position the register fins in a subsequent operation. From 14 to 24 holes are punched in each steel frame simultaneously at each cycle of the press—depending on the frame section sizes.

Formerly, the operator picked up a frame section from a nearby tote box, positioned it against the die stop, then actuated the press with a foot pedal. The operator worked fast, and sometimes the alignment of the frame section in relation to the press punches was not always just right. Vibration and the human element were contributing factors in making scrap.



Air ejects frame . . .

When the job calls for a low cost hardenable stainless steel...

17-4.PH

gets the nod. It is especially resistant to sea water corrosion and pitting and is recommended for ship propellers, pump impellers, marine applications, and a variety of uses involving the handling of foods and chemicals where corrosive conditions are mild. 17-4-PH is a precipitation hardenable alloy, quality cast at Cooper Alloy to the following typical composition:

Carbon .04 / Chromium 16.50 / Nickel 3.40 / Copper 3.65

Typical Mechanical Properties (Age Hardened)

| | | |
|--------------------|---------------|-------------|
| T.S. (psi) 179,000 | Red. Area % 7 | Brinell 388 |
| Y.S. (psi) 150,000 | % Elong. 2" 4 | |

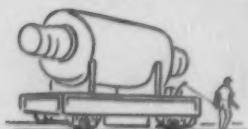
Complete data on request.

COOPER ALLOY
CORPORATION • HILLSIDE, N.J.

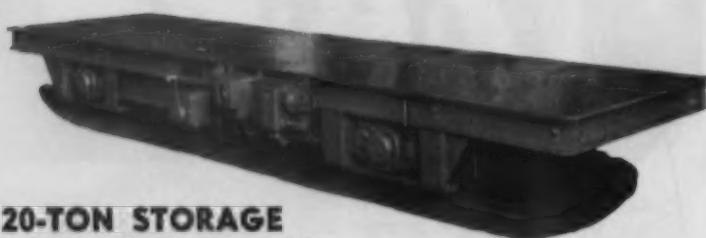
• Foundry Products Division

ATLAS SAFETY TYPE

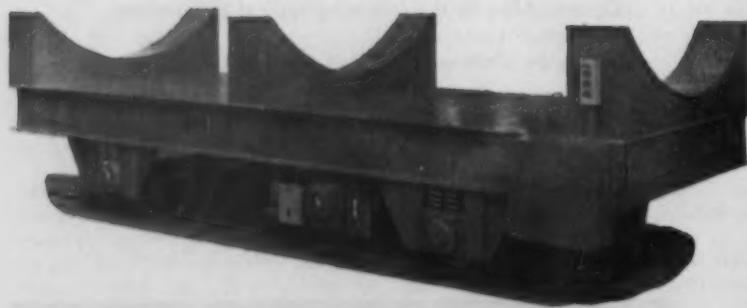
"SHORT HAUL" TRANSFERS



Atlas Safety-Type Transfers provide safe, low-cost service. Available with gas or diesel-electric, cable reel, or storage battery power. Atlas Transfers handle any type of load . . . and the heavier the load, the greater the savings.



20-TON STORAGE
BATTERY FLAT CAR



20-TON STORAGE BATTERY
WITH CRADLE FOR PIPE

Request "Walk-Along" Bulletin 1283



THE ATLAS CAR & MFG. CO.

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CLEVELAND 10, OHIO, U. S. A.



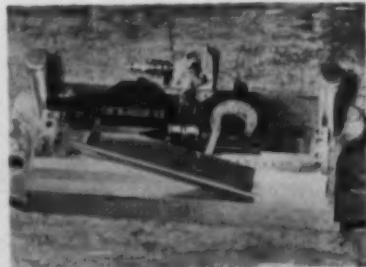
It was bad enough to produce a scrap piece at this point. But the big damage often came through scrapping the whole assembly after man-hours were expended in welding the four sides of the register frame together and installing the fins. Scrap parts sometimes ran as high as 10 pct daily.

To overcome the situation, Hart & Cooley's production engineers worked with those from Carboloy Dept., General Electric Co., Detroit. They redesigned the press die to hold two simple horseshoe-shaped permanent magnets.

Magnets Clamped to Die

Magnets used were the Alnico 5 type with a rated pull of 25 pounds against the proper steel keeper. These were mounted and clamped in the die and encased in non-magnetic blocks of fiber material. The whole magnet was insulated from the steel die except for the ends facing the die stop.

In the present setup, the operator simply positions the steel frame against a stop at the left end of the die. Pull of the magnets does the rest—automatically snapping the part tightly against the die in perfect alignment with punches.



Magnets hold it . . .



Position the frame . . .

TECHNICAL BRIEFS

Power:

Fully-automatic unit suitable for small plants.

An automatic steam generator, which combines the economy of coal with high efficiency and convenience in compact and automatic equipment, has been designed for commercial and small industrial plants.

This development announced by Bituminous Coal Research, Inc., provides a coal-fired unit in a size range anticipated to be from 1500 to 20,000 lb of steam per hour and pressures up to 300 psi. It will be applicable for space heating, process hot water, and high-pressure process steam installations.

Makes Ash Removal Easy

The generator's heart is the coal stoker. It has a water-cooled, vibrating grate and is of the cross-feed type. With such a stoker, the front to rear flow pattern of coal and ash permits ash collection at a single point at the rear of the furnace, facilitating the design of automatic ash-removal equipment.

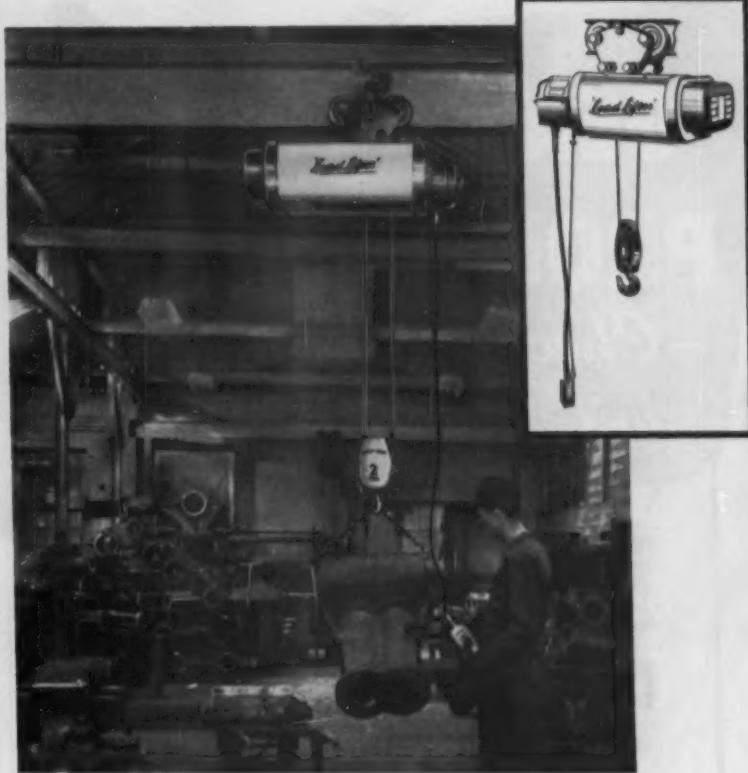
The vibrating grate requires only an eccentric sheaved to the driving motor. It provides a simple drive mechanism not possible with other types of coal burners. The water-cooling feature of the grate should enable burning of coals having low ash-softening temperatures and result in minimum grate maintenance.

Unit Still Under Test

The pilot model of the generator was installed for test at the BCR Laboratory. Its components include a low-pressure Kewanee fire-box boiler with a rating of 1490 lb of steam per hour, and an adaptation of an American Engineering Co. Vibra-Grate stoker with $8\frac{1}{2}$ sq ft of grate surface.

A twin-screw ash conveyor adaptable to a wide variety of fire-box boilers as well as several water-tube designs, is also included. A simple and compact control system provides easy access for initial settings and adjustment.

Turn Page

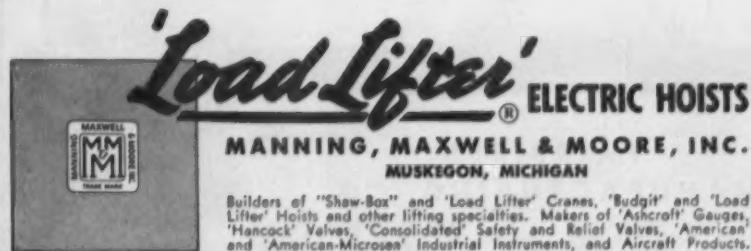


QUICK TO LIFT... QUICK TO SAVE

Economy in load handling begins as soon as the Series "700" "Load Lifter" Electric Hoist goes into service. It is the heavy-duty hoist recognized throughout industry for complete reliability and low operating cost on the toughest production lifting jobs.

Shorten handling time in your plant with the Series "700" "Load Lifter". It lifts one ton 30 feet a minute. It has every feature to safeguard man, load, and hoist—steel suspension, safety load hook, powerful synchronized motor and load brakes, concealed wiring, and only 24 volts at the push button. The strong, flexible wire rope makes nominal side lifts safe and easy.

Learn all about the rugged, smooth-operating Series "700" "Load Lifter". Capacities: $\frac{1}{2}$ -ton up. Single and two-speed control. Ask your "Shaw-Box" Distributor for details or get a copy of Bulletin 410.



Builders of "Shaw-Box" and "Load Lifter" Cranes, "Budgit" and "Load Lifter" Hoists and other lifting specialties. Makers of "Ashcroft" Gauges, "Hancock" Valves, "Consolidated" Safety and Relief Valves, "American" and "American-Micron" Industrial Instruments, and Aircraft Products.

GEAR PROBLEMS?

-Check with

FAIRFIELD!

If you use gears in the product you make, we believe it will pay you, as it has others, to become acquainted with FAIRFIELD—the place where fine gears are produced to meet your specifications **EFFICIENTLY, ECONOMICALLY!** Fairfield's production facilities are unexcelled for making all kinds of accurate, automotive type gears such as are now finding wide use in all branches of industry: for Tractors, Trucks, and Buses . . . for Agricultural Implements . . . for Machine Tools. Ask for latest literature describing Fairfield's facilities. *Your inquiry will receive prompt attention.*

Fine Gears Made to Order

SPUR GEARS—Straight, helical, and internal. Sizes from 16 pitch, 1½" dia., to 1½ pitch, 36" dia.

HERRINGBONE—(Fellows Type). Sizes from 1½" to 15".

SPRAL BEVEL—Sizes from 16 pitch, 1½" dia., to 1½ pitch, 28" dia.

STRAIGHT BEVEL—Sizes from 16 pitch, 1½" dia., to 1½ pitch, 28" dia.

HYPOID—Sizes from 1½" to 28" dia.

ZEROL—Sizes from 16 pitch, 1½" dia., to 1½ pitch, 21" dia.

WORMS AND WORM GEARS—Worms to 7" dia. Worm gears to 36" dia.

SPLINED SHAFTS—Lengths to 32". Diameters from 1" to 6".

DIFFERENTIALS—10,000 to 300,000 inch pounds capacity.

Note: All of the sizes above are approximate.

Ask for interesting, illustrated bulletin.

**FAIRFIELD
MANUFACTURING CO.**

2319 South Concord Road • Lafayette, Indiana



TECHNICAL BRIEFS

ments throughout the operation.

Early tests showed that overfire-air jets eliminated smoke and at the same time encouraged flame travel over that portion of the grate on which coking of the coal takes place. Changes were also to re-establish ignition in the coking area of the grate after starting from a bank.

All problems have not been solved, but satisfactory operations with extremes in coal-caking properties and ash-softening temperatures have been possible. In tests, completely automatic operation has been obtained. The combustion control, which is actuated by the steam pressure, effectively regulates the coal feed and forced draft over a wide load swing. The boiler has been operated at from 200 to 2400 lb of steam per hour with remarkably quick response.

Screw Conveys Coal

Coal is conveyed by a screw conveyor from the bin to the stoker hopper where, by means of a bin-level control, a constant supply is maintained for the stoker. An automatic ash conveyor removes the ash from the pit at the end of the grate to two ash cans. A timing device, set according to the percentage of ash in the coal, maintains a controlled level of ash in the pit.

At the turn of a switch, the plant automatically shuts down and a banked fire will be maintained for virtually an indefinite period of time, using from 1½ to 3 lb of coal per hour. Banked fires have been held for as long as 76 hours between runs. By repositioning the shut-down switch, the unit will automatically start up.

Patent Held Valid

A judgment upholding the validity of a patent covering electrodeposition of nickel from an acid bath has been entered in the District Court of the United States for the Eastern District of Michigan, Southern Division. The patent, U. S. 2,191,813, granted Feb. 27, 1940, and owned by the Udylite Research Corp. of Detroit, was held good and valid in law.



Automatically!

Demands by the automotive and steel fabricating industries have promoted the design of larger and faster presses. Satisfying the maximum capacities of these presses presents a problem in "Automatic" feeding. After all, there is no sense in designing more speed and capacity into a press unless it can be used to advantage.

Press builders and users both turned to "McKay," long a leading designer of "Automated" machinery, for a solution to their feeding problems.

McKay engineers came up with the answer with an "Automatic Press Feed Line" which includes: coil preparation, also cleaning, processing, leveling and feeding the strip in perfect condition at hitherto unheard of production speeds. THAT'S WHY TODAY THE TREND IS TOWARD MCKAY.

* * *

Other "Automated Equipment" built by McKay includes Strip Cut-up Lines, Bar and Tube Draw Bench Lines — Cold Roll Forming and Cut to Length Lines, Electric Weld Tube Mill Lines — Tube Cut-up Lines.

Consult with McKay engineers when you have a special "Automation" problem.

The MCKAY MACHINE
YOUNGSTOWN, OHIO

Company



ENGINEERS AND DESIGNERS OF
EQUIPMENT FOR THE AUTOMOTIVE,
FABRICATING AND STEEL INDUSTRIES



**New low
friction,
extra quiet,
high efficiency
bearing for
conveyor rolls.
Semi-precision
construction,
yet no increase
in price.**



*Write for your copy
of Folder X-1*

LOGAN CO., 345 CABIL ST., LOUISVILLE, KY.

Logan

Conveyors

Mill Rolls:

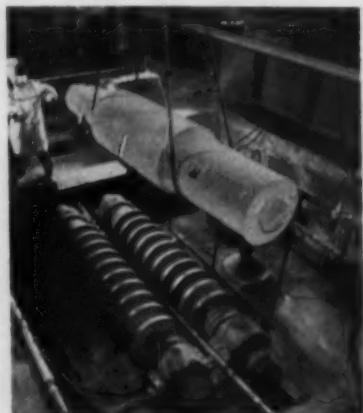
**Furnaces produce tailor-made
properties in mill rolls.**

In the old method of heat treating large quantities of mill rolls many sizes of rolls were treated in the same batch. The difficulties inherent in heat treating rolls of various sizes in the same batch left much to be desired in obtaining physical properties for individual rolls.

To remedy this situation, the Blaw-Knox Co., Pittsburgh, Pa., has installed 12 pit type cycle control furnaces. These heat treat only one roll per heat but because there are more furnaces volume of production can be maintained. This setup also assists in expediting orders which is an important factor in the roll making industry.

A complex, modern strip mill including all its auxiliaries represents a vast outlay of money. It must produce or the downtime charges will run into astronomical amounts. An average cost of \$1,000 per hour for downtime is not unreasonable. When rolls are pulled for redressing, or when any single roll fails, the loss-time clock begins ticking.

Basically, there are six major factors which determine the life which can be expected from any roll. They are metallic composition, molding practice, melting practice, feed of metal to the mold, heat treatment, and conditions under which the roll will be used.



Spins while cooling . . .

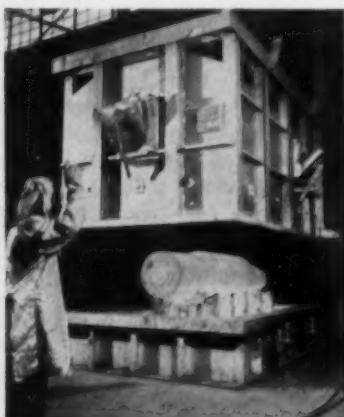
TECHNICAL BRIEFS

When a roll order is received at Blaw-Knox, the first step is to call a meeting where the desired characteristics of the end product are outlined and discussed. Foundrymen, salesmen, metallurgists, and management detail the techniques of production.

Roll Requirements Vary

While certain general patterns will apply, each roll is, nevertheless, tailor-made. For a strip mill work roll, the basic requirements are normally surface hardness and a penetration of that hardness, so that the roll can stand many redressings. The roll must also have ductility and resistance to spalling. Almost conversely, a blooming mill roll must have built-in strength to withstand shock, resistance to fire cracking and wear. Here are two opposite problems in roll making.

While heat treating actually begins with the molding techniques, since chillers in the mold affect the rate of cooling of the casting, thereby affecting the hardness, the real heat treating especially in steel rolls begins after the rolls are solidified and are shaken out of the mold. According to Dr. F. H. Allison, Jr., vice-president of Blaw-Knox in charge of rolls sales and metallurgy, the new furnaces have paid off in two ways. In the old furnaces from 300 to 400 tons of rolls would be put into the furnace at one time. While this seems like poor practice, and is, it is still not



Heat treating roll . . .

Which of these jobs
gives you trouble?

**Oakite
has 6
new ways
to
help you**

Oakite chemists have developed efficient new materials for the six important jobs listed below. One of these new materials may provide the perfect solution for your most difficult problem.

| | |
|---|---|
| 1 | HEAVY-DUTY CLEANING IN TANKS: New material combines the best qualities of alkaline and solvent cleaners. |
| 2 | PHOSPHATE COATINGS: One material cleans steel while applying dense iron-phosphate coating. Another surpasses government specifications for heavy zinc-phosphate coatings. Lasting paint adhesion, protection against corrosion, ease of control. |
| 3 | ETCH-CLEANING ALUMINUM: Uniform etching in preparation for anodizing or painting. Scaling and sludging minimized or eliminated. |
| 4 | ELECTROCLEANING BRASS: Efficient, economical cleaning without danger of tarnish. |
| 5 | INHIBITING PICKLE BATHS: Liquid inhibitor for sulphuric, hydrochloric and phosphoric acids. Saves steel, saves acid, builds own foam blanket to suppress pickling fumes. Easy to add to continuous strip or batch pickling operations. |
| 6 | STRIPPING PAINT: Two solvent strippers for synthetic enamels and other tough finishes. One so viscous it adheres to vertical surfaces of objects that can't be stripped any other way. |



FREE

Circle the coupon number corresponding to the job that gives you trouble. We'll send information about the new material for the work, also our 44-page illustrated booklet "Some good things to know about Metal Cleaning."

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OAKITE
MATERIALS • METHODS • SERVICE

Technical Service
Representatives in
Principal Cities of
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OAKITE PRODUCTS, INC.
24 Rector Street, New York 6, N. Y.

Send me a FREE copy of "Some good things to know about Metal Cleaning" and tell me more about the new Oakite material for the job (jobs) corresponding to the number (numbers) I've circled below.

1 2 3 4 5 6

Name _____

Company _____

Address _____

Look overhead..see "NORTHERN"



NORTHERN CRANES uniquely adapted for the Foundry Yard!

These two NORTHERN OVERHEAD ELECTRIC TRAVELING CRANES illustrate one of the many ways in which overhead materials handling equipment can be adapted for fully integrated production processing.

These 7.5-ton, 100-foot span cranes are installed in the foundry yard of a large automotive manufacturing company. To provide better vision and control of loading and unloading in all crane operations, the operators' cabs are attached to and travel with the crane trolleys.

Transfer loading to other handling equipment by means of batch weighing and loading hoppers was designed, built and installed by the customer company.

Here is another example in the short-cutting of repetitive, unprofitable materials handling. It demonstrates the substantial benefits of imaginative thinking in solving cost problems in all areas of plant operation.

Let us send you Bulletins G-700
and SE-108.

NORTHERN

CRANES - HOISTS - TRAVELATORS

NORTHERN ENGINEERING WORKS

210 CHENE ST., DETROIT 7, MICH.

TECHNICAL BRIEFS

uncommon in the industry. Each roll in the pile was given the amount of heat treatment necessary for the largest roll. In the new furnaces it is possible to heat treat only one roll at a time, and this roll can be given the rate and soaking time best suited for its individual dimensions.

Regulate Furnace Cycle

The new furnaces can be cycle regulated, which permits the heat treatment supervisor to set up a series of temperature changes. A charting unit for each furnace also makes a record of time and temperature changes, which can be checked against original specifications.

In these furnaces, each roll is given an individualized treatment, tailor made for the job it is to perform. Treatments include annealing, normalizing, quenching and tempering, and often combination practices.

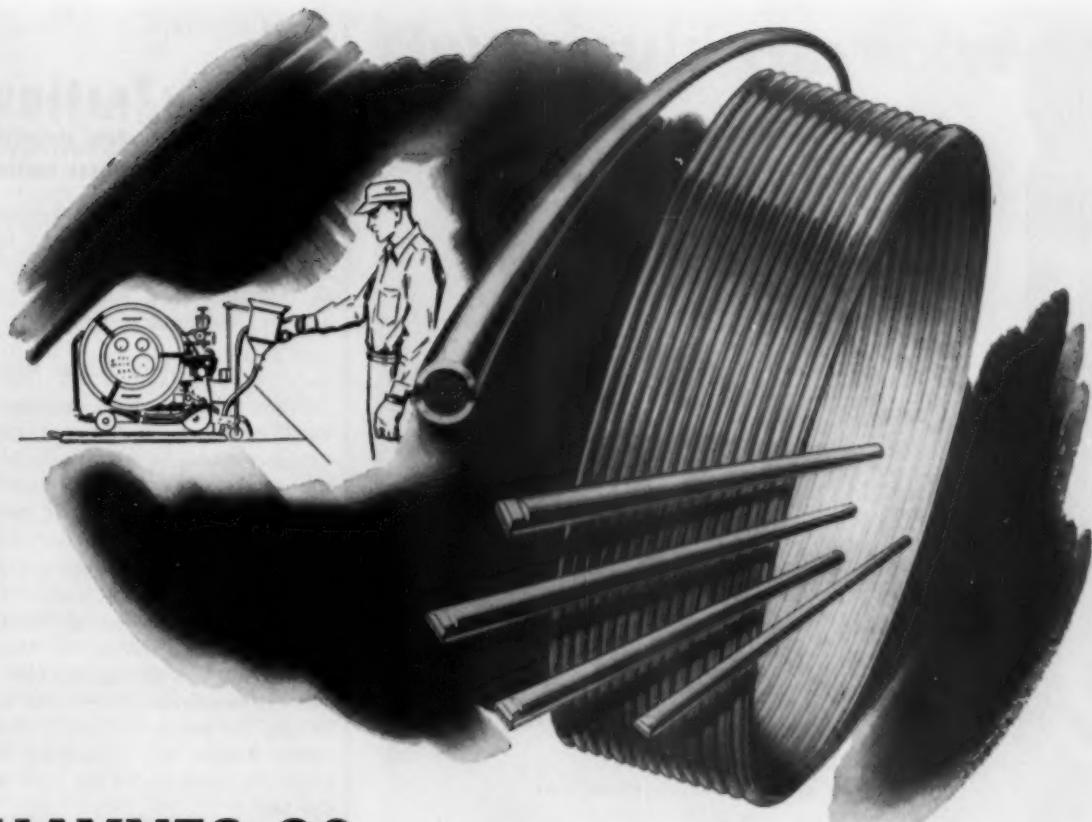
In the annealing process the as-cast structure of the roll is modified from a fairly coarse to a finer grain, and since the rate of cooling is slow, the process will provide minimum hardness.

Normalizing, a faster rate of cool for a roll, increases the hardness, tensile strength and yield strength with only slight modification of the roll's ductility as compared with the annealed state. This process is normally followed by tempering which involves reheating. This system is used especially in treating larger rolls.

Vary Temperature Range

In single, double or triple annealing the temperatures range from intermediate to very high. The time may vary depending upon roll size, from one week to 10 days for single annealing and from 10 to 20 days for special hardness treatments.

Quenching and tempering treatments are often used. Like the many factors involved in molding, casting, and feed of metal to the mold, the quench may also vary, ranging from quick to slow. Degrees of quenching include air blast, water spray, and full water.



HAYNES 90 alloy now available in tubes and at a MUCH LOWER PRICE

Now you can save even more by hard-facing wearing-parts with HAYNES 90 alloy. This is because HAYNES 90 costs so much less in this new economical tube form. These new tube rods produce sound, uniform deposits that won't crumble or flake off at temperatures up to 1000°F. They provide the same high abrasion, impact, and corrosion resistance—the same dependable protection for your equipment that HAYNES 90 brought to you as a cast rod—and at a much lower price.

For manual hard-facing, HAYNES 90 tube rod comes in convenient 14-in. lengths for easy application with standard metallic-arc welding equipment. For rapid coating of large parts, HAYNES 90 also comes in coils for

mechanized hard-facing by the submerged-arc, inert gas, and open-arc methods.

HAYNES 93, HASCHROME, and HAYSTELLITE alloys are also available in this economical tube rod form. HAYNES 93 iron-base rod is noted for high abrasion and corrosion resistance . . . HASCHROME iron-base rod for high impact resistance . . . and HAYSTELLITE tungsten carbide rod is tops for resistance to severe abrasion.

For more information about these new, inexpensive tube rods and coils, along with other HAYNES long-wearing hard-facing products, contact your nearest Haynes Stellite Company office today.

"Haynes," "Haschrome," and "Haystellite," are registered trade-marks of Union Carbide and Carbon Corporation.

HAYNES
TRADE-MARK
ALLOYS

HAYNES STELLITE COMPANY

A Division of Union Carbide and Carbon Corporation



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gears to your
specifications?
you bet!

Whatever your gear requirements may call for
with respect to size, type of basic material, accuracy,
quantity, delivery schedules . . . a call at Perkins today
can bring you many more practical reasons
why, for precision custom-made gears, it's a good idea,
and good economy too to CALL PERKINS
FIRST for quotations!

PERKINS MAKES : bevel gears, ratchets, sprockets,
ground thread worms, spiral gears, helical gears,
spur gears with shaved or ground teeth.

NOTE: The PERKINS PRECISION SPRING COILER is the
latest development in the spring coiler field and eliminates entirely
the use of arbors and long set-up time. It is a complete self-sufficient
machine and enables you to make the spring you want when
you want it — in seconds. The coiler produces any type
of spring, in any diameter and any pitch with this range:
Wire sizes .005 to .125. Diameter, from 3/32" to 12" and larger.
Size of the compact coiler is only 7 1/2" x 16".
A POWER MODEL is available. Information on request.

Perkins Machine & Gear Company
103 Circuit Avenue, WEST SPRINGFIELD, MASS.

Testing:

Light system simplifies hardness testing.

Use of colored lights to signal relative Brinell hardness of test pieces and indicate acceptability or rejection have simplified production hardness testing.

Colors Signal Range

When tied in with automatic handling of parts, the new unit can be made to physically sort the work after testing, making possible automatic Brinell hardness testing.

The three signal lights are set up so that yellow indicates "too hard," green designates "within range" and red shows "too soft." Limits are easily adjustable to suit the requirements of each job. During the test cycle, one of these lights flashes on, indicating the hardness category of the part under test.

Adjustable Electric Contacts

Basically, the new machine is the same as direct reading type Brinell hardness testers made by Steel City Testing Machines, Inc., Detroit, and used throughout industry for many years for production testing.

A dial indicator with adjustable electric contacts has been substituted for the standard indicator previously used, and this is connected to a specially-designed control panel. The machine is hydraulically operated.

Setup for Sorting Parts

To set up for completely automatic operation, the same circuits which operate the lights can be used to activate solenoid valves, switches, or other electrical equipment to physically sort the parts into the three categories.

An additional material handling means must also be provided, with the machine cycle to be started by microswitches when the part to be tested is properly located on the anvil.

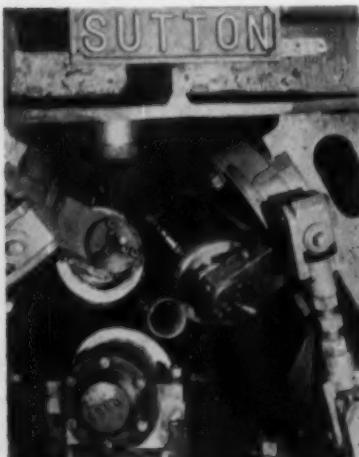
Straightener:

Improves end-to-end accuracy
in hot-rolled tubing.

A new model Sutton straightening machine has been put to use on hot-rolled seamless tubing which requires a high degree of end-to-end accuracy. It is installed at the Wooster, Ohio plant of The Timken Roller Bearing Co. Tubes range in size from $1\frac{1}{4}$ to $3\frac{9}{16}$ in. OD and are used for making roller bearings and transmission parts.

Rolls Arranged in Clusters

The straightener Model 2 MK-TC, is only one of a complete line. All models in this line are 7-roll straighteners employing cluster-roll arrangements in the pass line. A three-roll cluster, consisting of a large driven roll with two opposed idler rolls, is located at the entry end of the machine. Another identical cluster is at the delivery end. Rolls in the clusters are positioned angularly at approximately 120° to each other to provide pressure all around the tube evenly. Between the clusters, at the center of the pass line, is an unopposed pressure roll. This unique 7-roll arrangement positively confines the work to the pass line without use of guides of any kind. It results in a consistently high-quality product at higher production speeds than would otherwise be possible.



Rolls set at angle . . .

How would you solve it?

**1 PRODUCTION
PROBLEM:**

To speed production and cut unit costs of removing forged flash from steel open-end wrenches. Billings and Spencer found that hard wheels were too slow, left unsatisfactory finishes, tired operators.



2 SOLUTION: A 3M Representative studied this production problem. After careful analysis, he recommended that this Hartford, Connecticut manufacturer switch to the 3M Method using Three-M-ite type belts on a backstand grinder.

3 RESULTS: Better finishes. An immediate production increase of 140%—from 75 to 180 pieces per hour. Each belt finishes up to 150 pieces (and then is used for other operations) with less operator fatigue. A 3M Representative can solve your problems, too.

WANT MORE INFORMATION?



Made in U. S. A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: P. O. Box 757, London, Ontario. Export: 99 Park Ave., New York 16, New York. Makers of "SCOTCH" Brand Pressure-Sensitive Tapes, "SCOTCH" Brand Magnetic Tape, "3M" Adhesives, "Under-seal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing.

MINNESOTA MINING AND MFG. CO.
Dept. IA 35, St. Paul 6, Minn.



Send me free booklet: "Case History Reports on 3M Abrasive Belts"
 Please have 3M Representative call.

NAME TITLE

COMPANY

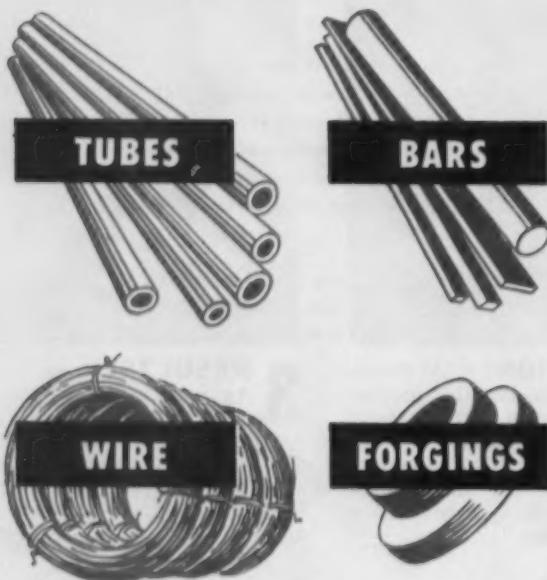
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STEEL TUBING and BARS



Write for the latest stock list

Contact our nearest office or write to Peterson Steels, Inc.,
Springfield Road, Union, New Jersey. Address: Dept. I

PETERSON STEELS, INC.
UNION, NEW JERSEY

Baltimore, Michigan • Chicago, Illinois

An outstanding feature of the 7-roll straighteners is their ability to handle tubing, casing and drill pipe having externally upset ends, at high production speeds. Production time is easily increased 20 to 50 times over press straightening.

Roll angles are automatically controlled and coordinated. Adjusting screws are power operated so that change-over for sizes can be accomplished rapidly, usually taking less than two minutes.

All controls are located for easy access to a single operator. Main motor controls are coordinated with table controls for convenient operation.

The Timken installation is powered by a 40-50-hp, 400-1600 rpm, 230-v, adjustable-speed direct current motor. It operates at straightening speeds of from 75 to 300-fpm. Its construction is rugged, using anti-friction Timken tapered roller bearings throughout.

Testing:

Abrasive jet method tests organic coating resistance.

A simple, rapid method for measuring the abrasion resistance of organic coatings on metals has been developed by the National Bureau of Standards. Essentially, the method determines the time required for a high-speed jet of fine abrasive particles to abrade through the coating to the substrate.

The development was sponsored by the Navy Bureau of Aeronautics for checking scuff-resistant finishes for naval aircraft. Because the instrument readily simulates a variety of service conditions, it can be used to determine abrasion resistance on all types of protective coatings, regardless of gloss, color, thickness, or surface area.

Simpler and Faster

Although the NBS abrasive jet method is similar in principle to older methods, it permits greater ease and rapidity in evaluating materials and better reproducibil-

1722
Different Cylinder
SELECTIONS-



AIR AND
HYDRAULIC CYLINDERS
AND BOOSTERS

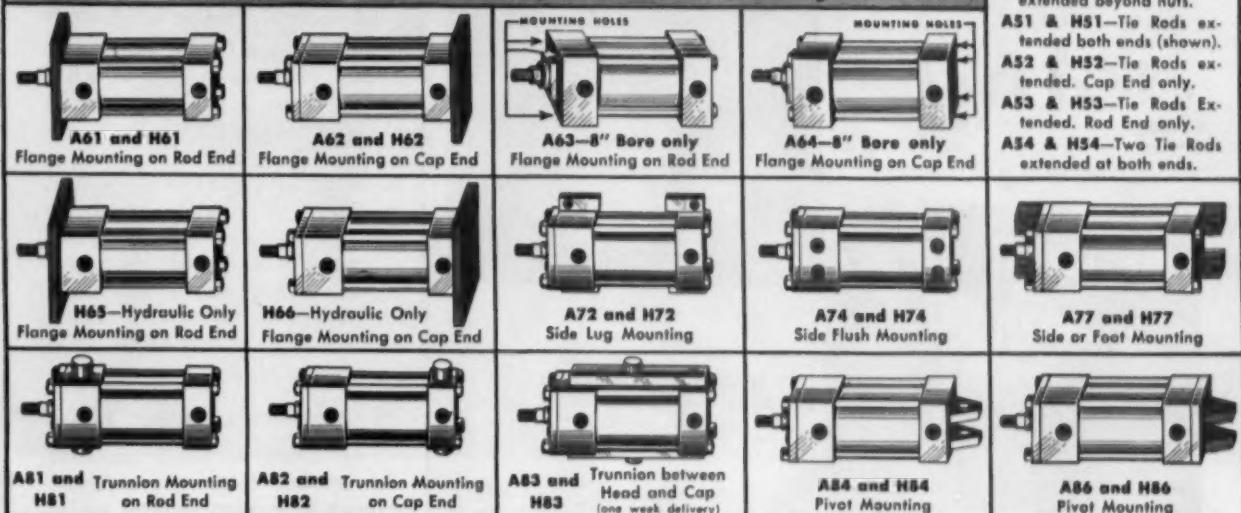
"IN STOCK"

for immediate delivery

See Miller Bulletins A-105K(Air) and H-104K(Hydraulic) for Complete Dimensions and Engineering Data on these "in-stock" sizes and other Custom Miller Cylinders in bores up to 20" and strokes up to 22 feet.

"IN STOCK" MODELS

"A" Signifies Miller 200 psi Air Cylinders; "H", 2000 psi Hydraulic Cylinders. Interchangeable Mountings Are Shown in Red On Drawings.

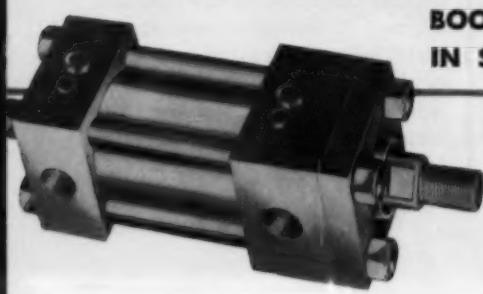


| IN STOCK BORES | BORES | ROD DIA. | ROD TURN DOWN AND THREADS | "IN STOCK" STROKES (In Inches) | | | | | | | | | | | | | | | | | |
|----------------------|-------|-------------|------------------------------------|--------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| A | 1 1/2 | 5/8" | 7/16-20 | Cushioned | | | | | | | | | | | | | | | | | |
| | 2 | 5/8" | 7/16-20 | Non-Cush. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 |
| | 2 1/2 | 5/8" | 7/16-20 | Cushioned | | | | | | | | | | | | | | | | | |
| | 3 1/4 | 1" | 3/4-16 | Non-Cush. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 |
| | 4 | 1" | 3/4-16 | Cushioned | | | | | | | | | | | | | | | | | |
| | 5 | 1" | 3/4-16 | Non-Cush. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 |
| | 6 | 1 1/8" | 1-14 | Cushioned | | | | | | | | | | | | | | | | | |
| | 8 | 1 1/8" | 1-14 | Non-Cush. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 |
| | 1 1/2 | 5/8" | 7/16-20 | Cushioned | | | | | | | | | | | | | | | | | |
| | 2 | 1" | 3/4-16 | Non-Cush. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 |
| HYDRAULIC | 2 1/2 | 1" | 3/4-16 | Cushioned | | | | | | | | | | | | | | | | | |
| | 3 1/4 | 1 1/8" | 1-14 | Non-Cush. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 |
| | 4 | 1 1/4" | 1 1/4-12 | Cushioned | | | | | | | | | | | | | | | | | |
| | 5 | 2" | 1 1/2-12 | Cushioned | | | | | | | | | | | | | | | | | |

BOOSTERS
IN STOCK

Immediate Delivery on the following Miller 25 to 5" Ratio Boosters (80 psi air input produces 2000 psi hydraulic oil output): Model 84, 5" bore, 1" dia. ram, 6" and 12" strokes; Reciprocating Booster Model DA77-RBAB, 5" bore, 1" dia. ram, 6" stroke. Also Booster Tanks, 5" dia., 6" and 10" heights.

Write For Catalog
and Stock Price List



MILLER FLUID POWER CO.

(Formerly MILLER MOTOR COMPANY)

2030 N. Hawthorne Ave. Melrose Park, Ill.

AIR & HYDRAULIC CYLINDERS • BOOSTERS • ACCUMULATORS
COUNTERBALANCE CYLINDERS



A50 & H50-Tie Rods not extended beyond nuts.

A51 & H51-Tie Rods extended both ends (shown).

A52 & H52-Tie Rods extended. Cap End only.

A53 & H53-Tie Rods Extended. Rod End only.

A54 & H54-Two Tie Rods extended at both ends.

"A" and "H" Models B2, 84 and 86 with strokes over 18" require step tubes.

Column strength requires larger diameter piston rods for the following:

Air Cylinder Models A82, 84, and 86 with strokes inside area (1), when operated at 100 psi and over;

All hydraulic models with strokes inside area (2) and Models H82, 84, and 86 with strokes in area (4), when operated at 2000 psi and over;

Models H82, 84 and 86 with strokes inside area (3), when operated at 1000 psi and over.

Depending upon Trunnion Pin location, "A" and "H" Models B3 with standard diameter piston rods can have longer strokes than Models B2, 84 and 86.

See Miller File #251 for oversize piston rod and step tube requirements.



Constant solder alloy control and consistent flux formulae combine to make Kester Flux-Core Solder the type of production "tool" that wins great popularity. And such popularity means a full spool of Kester disappears in a hurry because it's practical to use on every soldering operation.

KESTER SOLDER

COMPANY 4215 Wrightwood Avenue, Chicago 39, Illinois
Newark 5, New Jersey • Brantford, Canada

ity because it does not depend upon abrading an area of definite size and uses a continuously fresh supply of abrasive particles under closely controlled conditions.

The end point in this method is the first show of bare metal and is readily detected when coating and substrate differ in color, otherwise, inspection with a hand lens can be used.

Use CO₂ Carrier

Carbon dioxide gas under controlled pressure propels abrasive powder from a vibrating storage chamber through a nozzle to impinge upon the test specimen. The mounting arrangement for the test specimen and nozzle assembly allows for a variety of adjustments. A specially calibrated taper gage permits rapid and accurate adjustment of the nozzle-to-specimen distance at abrading angles from 20° to 90°.

Vacuum Exhausts Debris

The spent abrasive particles and coating debris are removed through a vacuum exhaust outlet at one end of the test chamber. Rapid monitoring of the abrasive flow rate is accomplished by a weighing tube.

Although operating conditions can be varied to accommodate extreme differences in materials, it is usually desirable to use a nozzle-coating distance of 0.04 in., a gas pressure of 40 psi, a flow rate of approximately 0.15 gps, and abrading angles of 90° or 45°. The 90° angle simulates the leading-edge type of erosion encountered by aircraft in flight, while the 45° angle simulates scuffing wear which aircraft receive during maintenance operations when they are walked on, struck, or scraped by hose nozzles.

Control Test Conditions

The abrasion time for a given material depends on the test conditions; it increases almost linearly with increasing nozzle-to-coating distance, decreases with increasing pressure, and decreases with decreasing angle of abrasion from 90° down to about 30°.

BEHIND  **LIMA** QUALITY



LIMA wagon cranes are self-propelled units with one engine mounted in the rotating assembly supplying the power for all crane operations. **LIMA** wagon cranes are available in 15, 20, 25, 30, 40 and 50 ton capacities.

LIMA'S fast service cuts costly downtime

From coast-to-coast Lima service engineers, warehouses and distributors are prepared to give you that extra-fast service or parts delivery which can make all the difference between continuous, profitable production and high-cost idleness of equipment.

When you buy a **LIMA** you can depend on long, trouble-free service, thanks to those extra quality features built into every **LIMA**. But if trouble happens and you need help, you get it from Lima . . . fast!

COMPARE QUALITY! No other machine gives you as much as **LIMA**!

1. Piston ring type dirt seal rings and retainers in crawler rollers.
2. Moving parts are flame or induction hardened for longer life.

3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at every vital bearing point.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional on certain types).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your **LIMA** on the job continuously.

COMPARE and you'll specify **LIMA** for shovels ($\frac{1}{4}$ yd. to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD



LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

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Construction Equipment Division • LIMA • OHIO • U. S. A.

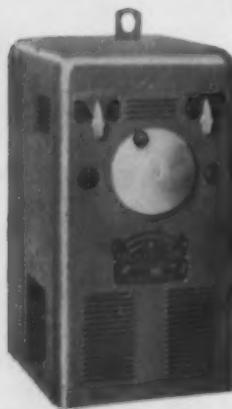
BOTH AC and DC WELDING CURRENT FROM ONE WELDER

New Lincoln Idealarc has soft arc and forceful arc with arc-booster starting on both AC and DC

With Lincoln's new Idealarc welder, you have complete freedom of choice in selecting the best type of arc for any job. You can choose AC or DC, whichever gives the best results. Then you can select a soft arc or forceful arc depending on position, type of electrode and weld appearance.

For the first time, shops that do not have 3 phase power can now use DC welding. Idealarc operates from single phase power.

Arc-booster starting is provided on DC as well as AC. This assures non-sticking operation, easier intermittent welding, complete penetration at the start of each weld.



LINCOLN IDEALARC

In One Machine—AC and DC
Soft arc and forceful arc in both AC and DC
Arc Booster Starting in both AC and DC

SEND FOR
BULLETIN 1343
ON LINCOLN
IDEALARC
Write:



THE LINCOLN ELECTRIC COMPANY

Dept. 1502
Cleveland 17, Ohio
THE WORLD'S LARGEST MANUFACTURER OF
ARC WELDING EQUIPMENT

MATERIALS ROUNDUP

ALLOY: High Impact Resistance

An improved alloy steel of high initial hardness has good resistance to impact, abrasion . . . Tensile strength at 470 to 520 Bhn exceeds 220,000 psi . . . Machinable and magnetic.

A new type of cast alloy steel, with high resistance to impact and abrasion, has been announced by American Steel Foundries, East Chicago, Ind. Known as Wearpact, this steel has been subjected to extensive field testing in taconite, hematite and copper mining operations.

This new alloy steel has high initial hardness, 470 to 520 Bhn, as shipped, and is combined with high resistance to impact. Thus, it has the ability to withstand abrasion and the toughness to withstand impact in the as-received condition. This initial hardness is retained in sections up to 6 in. thick, with only a slight reduction in hardness of thicker sections.

Resists Flow

Tensile strength exceeds 220,000 psi in the normal range of 470 to 520 Bhn. Yield point exceeds 180,000 psi, making the material highly resistant to flow and distortion. These values are retained at operating temperatures ranging from 450°F to -50°F. Charpy impact values are about 20 ft-lb.

Wearpact can be welded by conventional arc-welding methods with hardness affected only in the immediate area of the weld. It is machinable, using heavy-duty equipment, or it can be finished by grinding. It is magnetic so that if teeth or other parts disengage, they will be picked up by a magnetic separator before entering crushers. Differential hardness of castings is obtainable, when needed for soft center sections for easy machining or splining of bores.

No difficulties have been encountered in casting. It has been cast in the form of large crusher

FOR MORE DATA ON MATERIALS

More information on any item reported in this section may be obtained by using the reply card on page 137. Indicate the page on which the item appears and note exactly the information wanted.

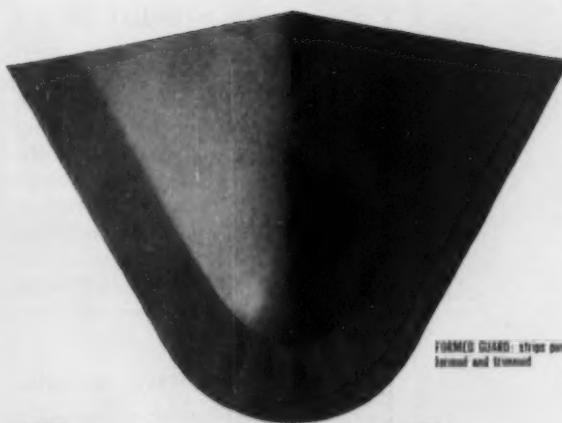
segments, down to the small-sized dipper teeth. Shrinkage rate is comparable to that of most cast steels and special patterns are not usually required. In many cases, patterns designed for use with austenitic manganese steel can also be used.

Direct comparisons have been made on applications where this alloy replaced other alloy steels. In one case, a chute liner handling taconite up to 8 in. in diam outlasted the previous liners by two and a half times. On a concave crusher handling taconite boulders, new liners showed no measurable flow or distortion after 4 months of service. Dipper teeth, compared to other alloys, show a service life ratio of as much as 3 to 1.

Coatings:

**Sprayed-on wrinkle finish
outwears baked-on materials.**

A new wrinkle-finish coating that looks like leather and is claimed to have ten times the abrasion resistance of conventional baked-on wrinkle finishes is now on the market. The highly attractive coating, known as Armorhide, is based on Bakelite vinyl resins. The economical spray-on method of applying the



WELDER'S MASK: sheet stock drawn, trimmed and punched.

FORMED GUARD: strips punched, formed and trimmed.

For Low-Cost Forming C-D-F DIAMOND FIBRE

- Arc resistant
- Non-corroding
- Mechanically strong
- Good dielectric qualities
- Easily formed and machined
- Light weight

For many product applications, Diamond Vulcanized Fibre is a proven, logical answer. Here is a low-cost material that can be bent, formed and drawn into permanent shapes. The "fibres" flow when moisture, heat and pressure are applied. They "set" as heat and pressure remove the moisture. Repeated moistening and drying never alter the nature, structure or quality of vulcanized fibre.

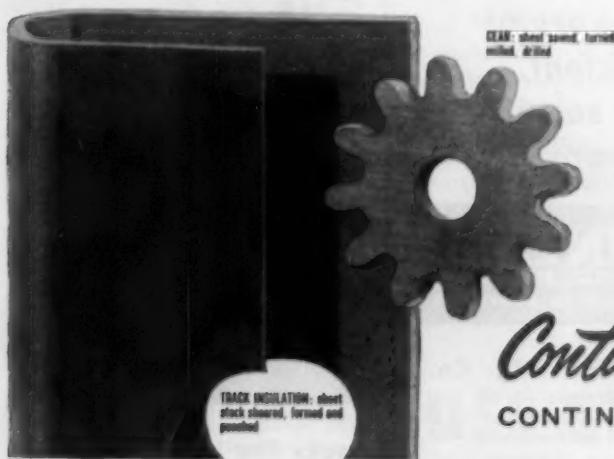
Deep shapes, such as welders' helmets, are made from a special "long fibre" C-D-F grade, a medium density, lightly calendered fibre with high impact strength.

C-D-F first made fibre in 1895 and has a wealth of manufacturing and fabricating experience. At Bridgeport, Pa., C-D-F has its own rag paper mill, is perhaps the world's biggest rag picker. Good vulcanized fibre depends on good, clean rags. C-D-F uses every human and mechanical means to keep Diamond Fibre free of metal. Thin and thick fibre in every size, type and color is stocked. Fibre materials handling equipment is manufactured for every industry.

Also, C-D-F does big-scale fabrication and forming at its Newark, Del., plant: Railroad track insulation, welders' helmets, machine covers, athletic equipment are formed here. Tubes, rods and combination fibre and laminated plastic Dilecto conite fuse tubing are major C-D-F Newark products.



BARRIER: Three pieces of sheet punched and formed; six pieces of fibre tubing used for rivets, then connected.



TRACK INSULATION: sheet stock sheared, formed and punched.

C-D-F IS A BIG, RELIABLE SOURCE OF SUPPLY!

Good deliveries, good prices, reliable products. That is the reputation of C-D-F with the world's leading users of vulcanized fibre. Whether your needs are big or small, C-D-F is a worthy manufacturing facility . . . ready to work for and with you. Call your C-D-F sales engineer (offices in principal cities). Write for Diamond Vulcanized Fibre catalog and samples.

Continental-Diamond Fibre
CONTINENTAL-DIAMOND FIBRE COMPANY
NEWARK 85, DELAWARE

MATERIALS ROUNDUP

textured coating was developed by John L. Armitage & Co., Newark, N. J. The first commercial use of the new coating provides distinctive new styling and a tough finish for the upper instrument panel of 1955 DeSoto automobiles. Back panels of fold-down rear seats in 1955 Plymouth and Dodge station wagons also use the long-lasting finish.

Wipes Without Smudging

Oil smudges, grease, dust, dirt and water wipe off without leaving a trace due to the excellent chemical resistance of the material. Using low-cost thinners, Armorhide can be sprayed on steel or aluminum in thicknesses from 0.002 to 0.015 in. in a single application. The application method employs a texturing agent to form the wrinkle finish.

A finish coat of any desired color is sprayed over a specially formulated metal conditioner, also based on Bakelite vinyl resins, for strong adhesion. Dispersed particles of the resin fuse into a continuous film when the complete coating system has been baked about 15 minutes at 350°F. After six months of field tests, this coating survived constant rough handling while conventional baked enamel finishes had worn down to bare metal.

Kinnear Steel Rolling Doors

Kinnear Rolling Doors are as well known for *extra years of service* as for convenience, space-economy and protection.

Two of the major reasons for this are shown in the drawing above at right.

The rugged interlocking steel slats are *heavily galvanized* — with 1.25 ounces of pure zinc per square foot of metal, by ASTM standards.

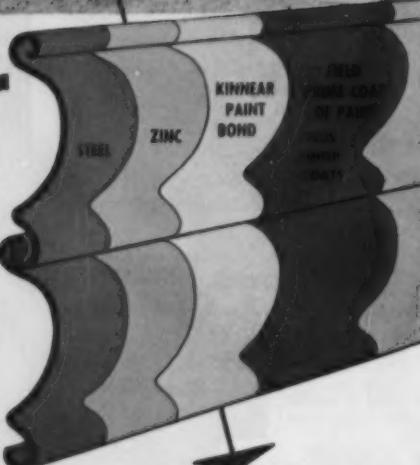
Then Kinnear's Paint Bond, a special phosphate solution is applied to make sure paint applied later will *cover thoroughly, adhere immediately, and stay on longer*.

That's why Kinnear Rolling Doors cut maintenance costs to the bone, and deliver peak efficiency year after year!

Opening straight upward, Kinnear Rolling Doors coil compactly *out of the way* above the doorway. Materials placed within inches of the face of the door curtain won't hinder its smooth, easy operation. Surrounding floor and wall space is fully usable at all times.

Kinnear Rolling Doors are built to fit openings of any size. Kinnear Motor Operators add the convenience of push-button control, with remote-control switches at any number of points, if desired.

Write for the latest Kinnear Catalog!



Heavily Galvanized

No wonder users
report 30, 40 and
50 years of
efficient,
daily service
from

KINNEAR
ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.

FACTORIES:

1760-80 Fields Ave., Columbus, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities



Coated panel . . .



Looks like leather . . .

Automatic film developing sink with top section of Stainless Steel.



Forming edges of top on 100-ton press brake.

Welding z-sections to underside of cooling tray.



How Stainless Steel helps make film developing automatic

DURABILITY, corrosion resistance and good looks are built into this automatic photographic developing sink through the use of Stainless Steel for the entire top section, including the two trays and the center bowl.

Metlmex Corporation, Lewistown, Pa., fabricator of this sink, makes a variety of products, working with both Stainless Steel and carbon steel. Fabricating equipment is used interchangeably with no special tools for working Stainless. The only difference in shop procedure lies in precautions taken to avoid marring the smooth surface of Stainless Steel.

Stainless Steel offers a unique combination of properties—plus ease

of fabrication. It's the answer to a wide range of design problems. And when you use it, be sure you get service-tested USS Stainless Steel.

FABRICATING FACTS

Sheets are sheared to size in a $\frac{1}{4}$ " capacity squaring shear and edges are then formed on a 100-ton press brake.

Front, sides, bowl and trays are assembled to form a complete integral stainless steel top unit. Metal-

lic-arc, heliarc, and spot methods are employed in welding temperature controlled trays and cabinets. Developer and fixing trays are attached to unit by riveting one side to stainless steel hinge permitting mechanical agitation.

Stainless steel panels are easily lock seamed to form center bowl section.

After assembly, entire unit is ground and polished to remove weld marks.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



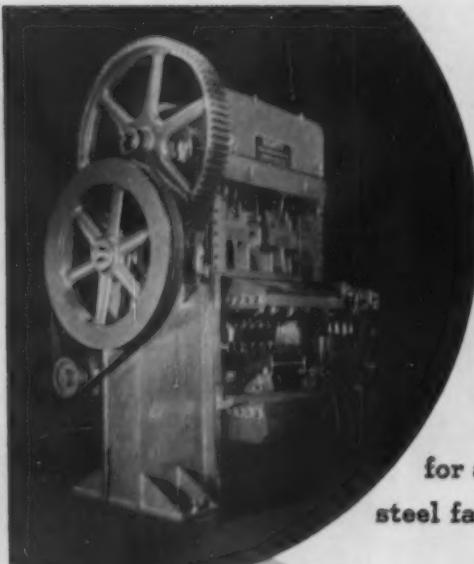
USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

B-696

UNITED STATES STEEL

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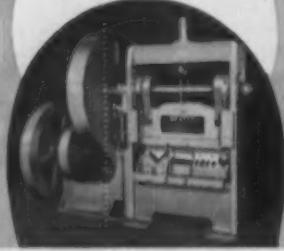


This Beatty Punch CUT COSTS 75%

for a structural
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One of our present-day satisfied customers formerly employed machinery using only one punch for punching structural steel shapes. After consulting a BEATTY engineer, this firm installed a BEATTY Guillotine Beam Punch with an adjustable tooling feature that enables them to perform exact repeats of multiple punch patterns in 25% of the time formerly required. Naturally, we can't guarantee such substantial savings in every industrial installation of BEATTY machines! But, if you're currently considering additional production machinery for your metal fabricating plant, better see a BEATTY engineer before making any final decisions! Chances are he'll have an idea or two on how you can achieve greater production economies with BEATTY Machines!

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for angles, bars, rounds,
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from 6" to 30".



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dles web and flange
punching without roll
adjustment.



BEATTY Gap Type Press for
forming, bending, flanging,
pressing. Capacity 250
tons.

Corrosion:

Surface treating material
protects from acids.

A surface treating material recently developed is reported to offer low-cost protection of concrete from fluorides, hydrofluoric acid and hydrofluoric acid solutions. The material, Ceilcrete "B," is made by the Ceilcote Co. of Cleveland.

A thermosetting plastic base surfacing, the material can be applied to floors, trenches, tank bases and other concrete structures. A minimum coating of $\frac{1}{8}$ -in. provides a monolithic membrane that is impervious to solutions containing hydrofluoric acid.

The extreme density and stone-like hardness of Ceilcrete "B" makes it ideal for a wide variety of applications where resistance to abrasion, impact and constant immersion in acid solutions are important.

For Pickling Tanks

In many applications the material has been used in place of brick. One example is lining of pickling tank pits where hydrofluoric acid is being used.

In this application walls, sides and floor were coated with $\frac{1}{8}$ -in. of Ceilcrete "B" providing a monolithic membrane protecting the concrete.

Ordinary practice in such instances has been to protect floors where service conditions are most



Protects from acid . . .

MATERIALS ROUNDUP

severe with 2½ or 2½-in. of brick. Walls that are subjected only to spillage and splash are protected with 4-in. of brick to achieve stability of the sheathing. Use of the new material in this application has substantially reduced the cost and proven completely satisfactory as a replacement for brick.

Titanium:

Two new alloys developed by Mallory-Sharon.

Quantity production on two new titanium alloys was begun recently by Mallory-Sharon Titanium Corp. of Niles, Ohio.

The first of the two alloys in production at Mallory-Sharon is the 6 Aluminum—4 Vanadium Alloy (MST 6A1-4V), developed by Armour Research Foundation under contract to Watertown Arsenal Laboratory.

The composition was suggested originally during a research and development program under government contract, carried out by Armour, and supervised by personnel of the Watertown Arsenal of Army Ordnance Corps.

Cooperative Effort

In the engineering and initial production phases of this alloy, Mallory-Sharon co-operated with Pratt & Whitney Aircraft, division of United Aircraft Corp., which ran short-time high-temperature tests as well as tests for notch sensitivity on the alloy, and with Watertown Arsenal which worked on heat treatment.

This is one of the first weldable titanium alloys having high notch toughness and it has properties comparable to those of high strength steels used in armor plate and weapons.

Tests on the MST 6A1-4V alloy show that it overcomes the brittleness present in many other commercial high-strength titanium alloys. It also has excellent thermal stability and can be used at temperatures up to 750°F with maximum resistance. To date, Mallory-

Turn Page

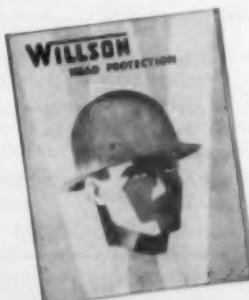
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MATERIALS ROUNDUP

Sharon has supplied quantities of the alloy for several jet engines.

Made By Double Melting

The second alloy—termed the 3 Manganese Complex Alloy—is composed of 3 pct manganese, 1 pct chromium, 1 pct molybdenum, 1 pct vanadium, 1 pct Fe, with the balance titanium.

The alloy is made by Mallory-Sharon's "Method S" process, double melting using a consumable electrode. It's the first heat-treatable titanium alloy available in production quantities whose properties can be varied predictably by heat treatment.

It also meets the need for a high-strength alloy containing a minimum of strategic alloys and harmful alloying ingredients. Designed for use up to about 500°F, the alloy promises an excellent future where a lightweight replacement for high-strength steel is required.

Greater Strength Sought

This important new alloy was also the result of co-operative endeavor. Mallory-Sharon officials report the alloy was developed by Battelle Memorial Institute, under Air Force contract in conjunction with the Wright Air Development Center Titanium Alloy Research Program.

The Air Force's objective was a material that could compete with steel in strength and still save weight. Battelle's work in developing the alloy extended over several years. The Institute approached the problem from the standpoint that such material should be heat-treated in the same way as steel.

Mallory-Sharon's research on a similar project—to produce a heat-treatable titanium alloy sheet—led it to volunteer to co-operate with Battelle in the engineering and production stages.

Several thousand pounds of the manganese complex alloy have been produced with the vacuum double-melting method which assures maximum homogeneity of ingots with close control of alloying elements.



How Men and Controls Protect Industry's Confidence in *Carpenter* High Speed Steels

The performance you get from high speed steels is directly related to how they are produced. As a specialty mill where quality overshadows tonnage . . . and all operations are set to this standard . . . Carpenter devotes the time and attention required to produce high speed steels of the finest quality.

From careful scrap purchasing to guaranteed analysis, and painstaking time and temperature checks during melting . . . through rigid controls of bar reduction in rolling, and many other quality tests at all steps . . . these are the "indispensables" that have enabled Carpenter to produce the finest High Speed Steels for 60 years. And most important is the *personal attention* Carpenter men give to every order. The experience, pride and skill these craftsmen put into the production of every bar make Carpenter High Speed Steels your most dependable investment. Your best proof is to place your next order with Carpenter . . . and see what a difference there can be in High Speed Steels. THE CARPENTER STEEL COMPANY, 121 W. Bern St., Reading, Penna.

Every Order of *Carpenter* High Speed Steels Undergoes These and Many Other Quality Controls

- All scrap must be of purest quality, guaranteed analyses.
- Small, electric furnace melting units are used to control quality and uniformity to the highest degree.
- Every heat of steel is constantly checked for chemistry, temperature and melting time.
- Preheat and high heat furnaces are guarded for accurate time and temperature to prepare the steel for rolling.
- Percentage of reduction in cogging billets for rolling or forging of bars is skillfully controlled to assure freedom from internal stresses.
- Discs cut from each bar are acid etched, examined, hardened and fractured to certify internal cleanliness, soundness, freedom from excessive segregation. And the hot acid etch is backed by Ultrasonic Testing.
- Slugs are cut from each lot of billets and machined in "step-down" fashion to guard against internal seams, shadow lines, etc.
- Extensive laboratory tests are made for proper hardness, micro-structure, grain size.
- Turning tests are run regularly to check cutting efficiency.
- *For best results, put your confidence in . . .*



***Carpenter* STEEL** high speed steels





when it comes to **AUTOMATION**

This eight station multiple spindle dual loading Transfer Type Machine uses an air-hydraulic transfer mechanism. Various drilling and tapping operations are performed on cast iron carburetor throttle bodies at the rate of 450 per hour at 100% efficiency. Parts are located and clamped automatically in previously machined butterfly valve holes at each station. Parts ride free on rails between work stations. New brochure shows why, when it comes to automation . . . it pays to come to . . .

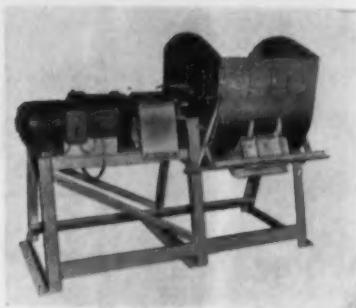


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NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies...for more data use the free postcard on page 137 or 138



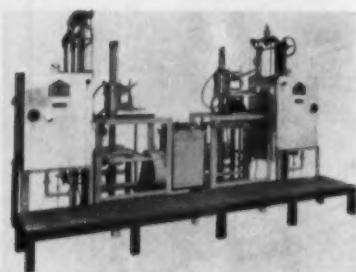
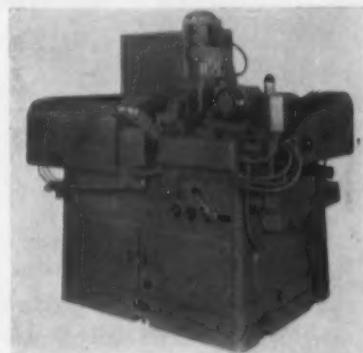
Automated grinder rated at 115 pistons per hour

This new precision grinder automatically loads, grinds and discharges automotive pistons. Aluminum pistons can be delivered to the machine by conveyor and transfer mechanism. An automatic timed loader places the piston in grinding position. Rotation begins as the grinding wheel advances rapidly to grinding position. Slow grinding feed then proceeds to a positive, predetermined size. After

Designed for service in foundries a new sand mixer with capacity of 5 cu ft of sand completes the mixing process in 3 min. It is self-contained and powered by a 3 hp electric motor. The mixing process always is in view and test samples can be taken at any time. The mixing box is lined by three $\frac{1}{4}$ -in. high carbon plates which are

easily replaced. Mixing is done by four flanged paddle arms holding mixing blades. The batch is discharged by operating a hand lever with ratchet which opens a 7 x 15 in. gate. Gate discharges to a chute which delivers the mixed sand to any container. *McLanahan & Stone Corp.*

For more data circle No. 33 on postcard, p. 137.



Power sweepers meet industrial plant needs

A new 4 model line of power sweepers for industrial use feature Filter-Vac dust control with easily removable dust bin, automatic dumping, large hopper capacity, 20-in. curb brooms for closer sweeping, exceptional maneuverability and electrically welded heavy plate steel construction.

Forty molds per hr are claimed as normal production of Shelmolda Altus, a duplex machine with two gas or electric ovens with pneumatically operated doors. Ovens are thermostatically controlled and almost all operations are performed mechanically. Effective size of the pattern plate is 16 x 16 in. and

16 x 12 in. The machine has a central dump box. Production of shell molds is continuous; while one shell is being cured another is being made. The machine is equally suitable for ferrous and non-ferrous metals. *Fairbairn Lawson Combe Barbour, Ltd.*

For more data circle No. 35 on postcard, p. 137.



Range of sweeping paths is 24 to 58 in. and a maximum sweeping coverage is over 100,000 sq ft per hr. The new power sweepers are engineered to the same principles test-proved by the rugged Wayne street sweepers. *Wayne Mfg. Co.*

For more data circle No. 36 on postcard, p. 137.

Turn Page

only **SOUTHCO** drive rivets offer all these benefits!



Rivet and Mfg. Patented.

A HAMMER IS THE ONLY TOOL

DRIVE LIKE NAILS

**AUTOMATIC "PULL-UP" ACTION
FORCES PARTS TOGETHER**

Note

No special tools to buy or maintain, no bucking up, no finishing, no noise, no material waste.

Just hit the pin, the rivet's in . . . that's all.

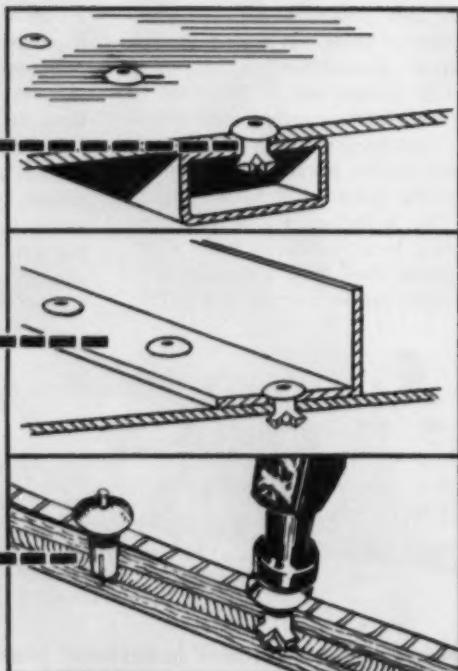
On your production line, where can savings be made with Southco Drive Rivets? Write for complete data. Southco Division, South Chester Corporation, 238 Industrial Highway, Lester, Pa.

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APPLICATIONS**

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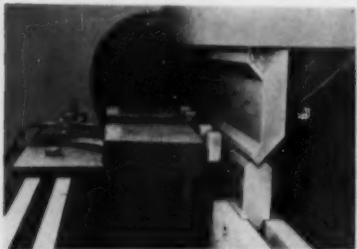
WHEREVER TWO OR MORE PARTS ARE FASTENED TOGETHER; STANDARD AND SPECIAL DESIGNS FOR IMPROVED PERFORMANCE AND LOWER PRODUCTION COSTS

Shell and tube exchangers for cooling applications

Four standard models of Nocordal shell and tube exchangers can maintain an acid bath temperature at 25°F. Rubber-lined and cork-insulated piping connects exchangers to the holding tank. Higher transfer rate obtained through forced flow, coupled with high co-

efficient of heat transfer inherent in Nocordal construction enable a reduced area of exchanger surface to adequately handle the cooling requirement. Standard units can be modified for special applications. *Heil Process Equipment Corp.*

For more data circle No. 37 on postcard, p. 137.



Magnetic intensity increased in new grate magnet

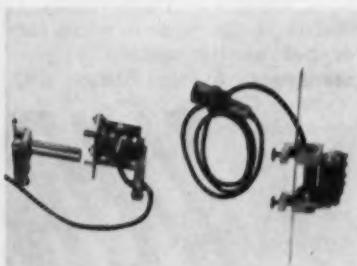
An improved grate magnet has redesigned tubes that provide a more potent magnetic circuit. Overall magnetic intensity in the area immediately between the tubes has been increased 15 pct. In a recent quality-control test conducted by an independent laboratory, this new high-strength magnetic grate separator removed 93 pct of 100-200 mesh iron contamination from

free-flowing material. The powerful Alnico V magnetic element, enclosed in stainless steel tubes is designed to align iron accumulation parallel with the tubes, preventing choke ups and guarding against possibility of tramp iron being brushed off by subsequent flows of material. Steel tubes are cleaned by removing grill. *Ericz Mfg. Co.*

For more data circle No. 38 on postcard, p. 137.

age. It is easy to install and operate. One man can handle large sheets easily and safely. Accuracy is maintained because the magnetic force draws the material evenly to the gage and holds it securely. *American Actuator Corp.*

For more data circle No. 39 on postcard, p. 137.



Extensometer for producing stress-strain curves

A non-averaging, screw-on separable Microformer type extensometer has been announced for use on $\frac{1}{2}$ in. wide flat specimens 0.005 to 0.250 in. thick with 2-in. gage length. The instrument is intended for use with Microformer type recorders to produce stress-strain curves up to failure of specimens

that exhibit brittle type fracture. Strain magnifications are 250, 500 and 1000:1 with a measuring range of 0.05 in. Telescoping the two parts of the extensometer establishes the initial starting gage length on the specimen. *Baldwin-Lima-Hamilton Corp.*

For more data circle No. 40 on postcard, p. 137.

Mineral shot is dustless, economical blast-cleaner

Nonmetallic, dustless blast-cleaning agent is said to permit substantial savings in production time, material cost and blasting equipment maintenance. Called Mono-Kleen, the spherical mineral shot blast cleans uniformly in one pass with no dust clouding the operator's vision and leaving the surface free of grime, film and dust. Blast-cleaning time can be reduced 50 pct with one-third less

material, as compared to sand. Spherical characteristic of the shot reduces wear on the blasting equipment. Because it flows more freely and requires lower impact velocity, lower blasting pressures and reduced power costs are obtained. Mineral shot can be reclaimed and reprocessed for use again. *Baldwin-Hill Co.*

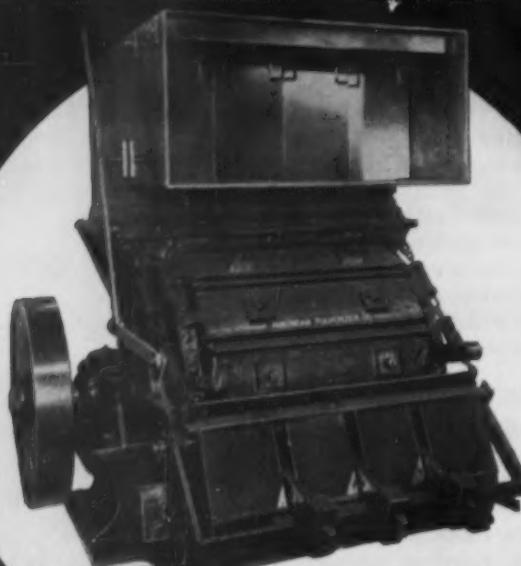
For more data circle No. 41 on postcard, p. 137.
Turn Page



NEW EQUIPMENT

CASH IN YOUR CHIPS

Change Metal Turnings Waste
into More Profitable Shoveling CHIPS



American
METAL TURNINGS

CRUSHERS

No progressive, profit-conscious company—who produces 10 or more tons of metal turnings per month—can afford to ignore the profit potential of a modern chip salvage system . . . with an American Metal Turnings Crusher at the core.

American installation profits include: \$4 more per ton for chips than for machine turnings; up to 50 gallons per ton in cutting oil recovery; 75% less storage; easier, faster handling.

How many profit dollars are you losing under present operations? If, for example, you're currently producing 20 tons of turnings a month . . .

| THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR! | |
|--|------------|
| 240 Tons Metal Turnings per Year | \$ 960.00 |
| (20 tons/month at \$4 extra per ton) | |
| 6,000 Gallons Recovered Cutting Oil at 30¢/Gal. | \$1,800.00 |
| (50 gals. per ton x 240 tons = 12,000 gals.) | |
| Half of this, 6,000 gals., can be credited to use of chips instead of turnings in reclamation) | |
| Estimated Savings in Manpower, Storage, Tools, Maintenance, Freight, etc. | \$ 300.00 |
| TOTAL GROSS PROFIT | \$3,060.00 |

WRITE for Metal Turnings Crusher Bulletin.



Suppliers and Manufacturers of Rock Crushers and Pulverizers
1439 MACKLIND AVE. • ST. LOUIS 10, MO.

Double rolling mill

Steam turbine blades of various sizes and shapes are forged on the K&R double rolling mill. Some of the sections are rolled hot while others are rolled cold. Most of the sections can be completed in two passes through the forging rolls. Both sets of forging rolls can be

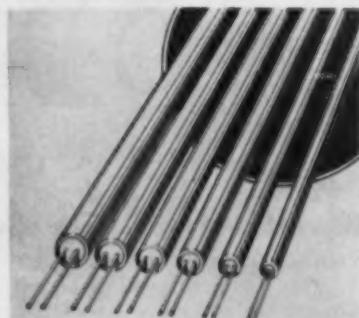


mounted at one time but only one stand of rolls is used at a time. Two rewinders are employed when coil stock is being used. A reversing motor is furnished so that when cut length material is being shaped, the stock delivered at the discharge end of the first-pass mill can be transferred across to the second-pass mill and completed. *Kane & Roach, Inc.*

For more data circle No. 42 on postcard, p. 137.

Wire insulation

A 2000°F wire insulation will last indefinitely, it is reported, eliminating costly wire replacements. It consists of one or more wires surrounded and insulated by pure magnesia in a metal sheath with



OD's from 0.04 to 0.32 in. This sheath creates a heat, shock and vibration resistance—a gas tight unit. It is available in a variety of sheath metals with thermocouples and other wire materials. *Aero Research Instrument Co.*

For more data circle No. 43 on postcard, p. 137.

Turn Page

A completely new and different
PAYLOADER®
 TRACTOR SHOVEL



**BUCKET
CAPACITY**

18 cu. ft.
PAYLOAD

14 cu. ft.
 Struck-Load

**NEW
MODEL
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Outstanding features:

Powerful "break-out" digging action. Upward rotation of the bucket combines with forward motion of machine in a powerful slicing action that gets full loads quickly, even from lumpy, sticky or heavy materials.

Bucket tip-back of 40 degrees when only 6 inches off the ground carries heaped loads *low* and *close* for maximum stability, balance and safety.

New standards of safety. Boom arms and parts are mounted *low* and carry loads *low* and are always clear of the operator. Operator visibility is good at all times.

Advance-design hydraulic system includes: sealed, pressurized hydraulic tank — no breathing of dirt and grit into hydraulic fluid; hydraulic accumulator prevents pressure shocks — gives easier, safer control.

Torque-converter drive and full-reversing transmission with two speed ranges insures fast moves in either direction — easier operation and control — more production.

Improved steering. Ball-bearing screw-and-nut type steering with tapered roller bearing bell crank and oversize ball joints — easy-acting, readily-adjusted, low in maintenance.

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capacity and low maintenance**

The greatest advance in tractor-shovel design in years — with more features — more digging power — more capacity — more performance than you ever thought possible in a tractor-shovel of this size.

The famous HA "PAYLOADER" has led the industry for over 15 years — this NEW 1955 Model HA is even more sensational. It has twice the digging power, lifting capacity and carrying capacity — has 16½% more bucket capacity — 18% more dumping height — and will increase output from 50 to 100%.

Before you buy any tractor-shovel, see this new Model HA — ask your dealer for a demonstration — find out what it can do to reduce your bulk material handling costs.



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NEW EQUIPMENT

20,000-lb capacity

Purpose of the Dyna-Switch is to prevent overload damage to costly hoisting equipment by automatically cutting out lifting power whenever the safety maximum is exceeded. This is done by means of a massive U-shaped bar of high grade tool steel, heat treated to flex



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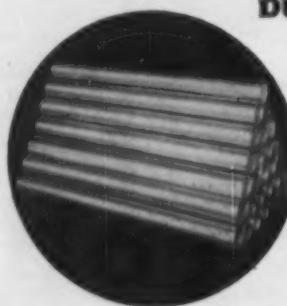
Which are
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When ready to order, how about checking with us here at DURALOY? For more than thirty years we have specialized in high-alloy castings. In fact, we were among the first to produce static castings and the first to produce centrifugal castings. We are old hands at producing castings alloyed to fit each specific requirement and to finish them to any extent desired.

Melt, castings and finishing are carefully controlled and quality tested by our staff of metallurgists, chemists, X-ray and gamma-ray technicians. If you would like more preliminary information, send for Bulletin No. 3150-G.

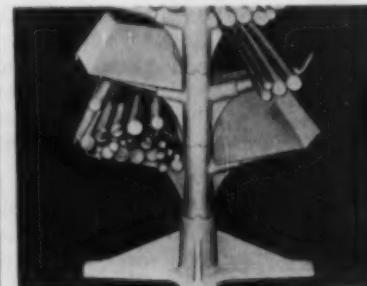
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millions of cycles without losing its resiliency. Attached between the load and the hoist, it trips a sensitive micro-switch whenever the bar is deflected beyond its pre-set operating point, thereby breaking the lifting circuit. Accuracy is said to be within $\frac{1}{2}$ of 1 pct, with a safety factor of $3\frac{1}{2}:1$. *W. C. Dillon & Co.* For more data circle No. 44 on postcard, p. 137.

Bar, tube stock trays

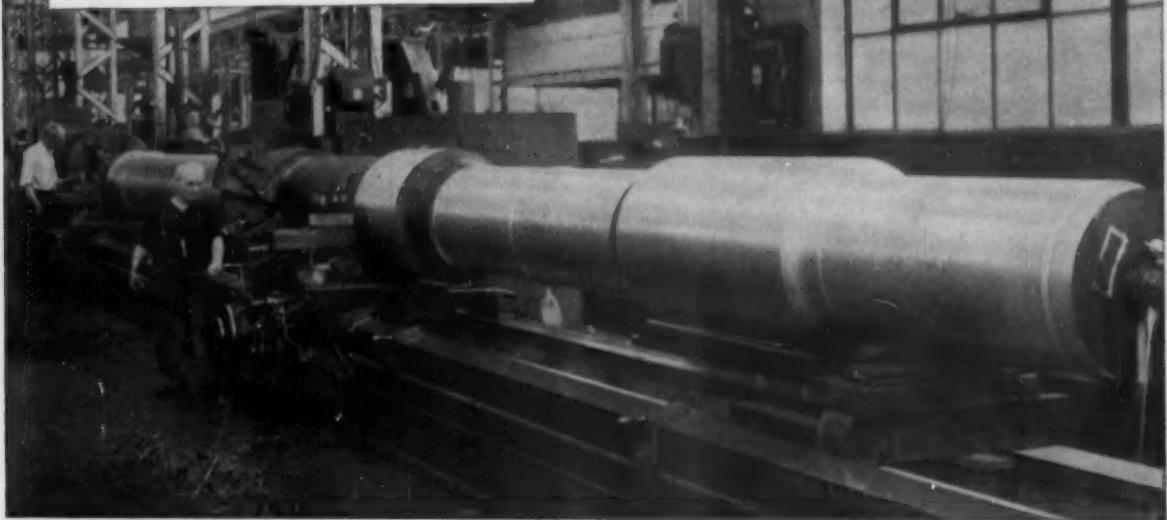
As an accessory to Quick-Service sectional stock racks for bar, rod, tube, pipe, or strip, stock trays are useful for storing miscellaneous stock items too short or to whippy to span two regularly-spaced racks.



Stock remnants are stored conveniently on the sturdy tray, which simply lies snugly across two adjacent rack arms. The trays are 5 in. deep, 4 standard widths, and have 4, 6, or 8 ft span. *Brown Engineering Co.* For more data circle No. 45 on postcard, p. 137.

Turn Page

35-Ton Nickel Steel Shaft for 14' x 115' double drum hoist driven by a 6,000 horsepower dual-motor. This shaft is 46½' long and has a maximum diameter of 28". It is now in operation at the Frood-Stobie Mine of the International Nickel Company of Canada, Ltd., helping to speed the output of nickel ore for nickel alloys.



How nickel strengthened the shaft for Canada's highest powered mine hoist

IN LARGE FORGINGS such as this giant shaft, high tensile and elastic properties do not come easily.

Liquid quenching of heavy forgings is usually impractical. Even when the shape is such that this treatment may be safely applied, the section sizes involved often restrict cooling to rates which render the quench ineffective.

Increased strength, hardness, toughness and other mechanical properties in a large forging depend to a great extent upon selection of alloy content.

Accordingly, to attain maximum strength and toughness in the shaft of Canada's highest powered mine hoist, at our own Frood-Stobie mine, we specified a shaft forged of 3½% nickel steel . . .

Because nickel, either alone or in combination with other alloying elements, provides a number of advantages.

For one thing, it has a strengthening effect on ferrite . . . independent of carbon content or heat treatment of the steel.

For another, it lowers the rate and temperature of the upper transformation, thus inducing better response to the necessarily milder heat treatments used. And it reduces grain growth.

Whenever you face a metal problem, let us help you make a selection that will meet your particular fabricating and service requirements. Send us details of your applications, for our suggestions.



Double Drum Hoist for the Frood-Stobie Mine, during course of shop erection by the builder, The John Bertram & Sons Co., Ltd., Dundas, Ontario. Spiders that support the steel shell of the hoisting drum were cast in an iron containing 1½% nickel . . . to assure adequate strength in the 74,600-pound drum-spider assembly. This hoist, operated by push button control from a station far underground, can lift skips containing 15 tons of nickel-copper ore, at an average rate of 14,000 tons daily.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET
NEW YORK 5, N.Y.

ARMSTRONG

SET-UP and HOLD-DOWN TOOLS



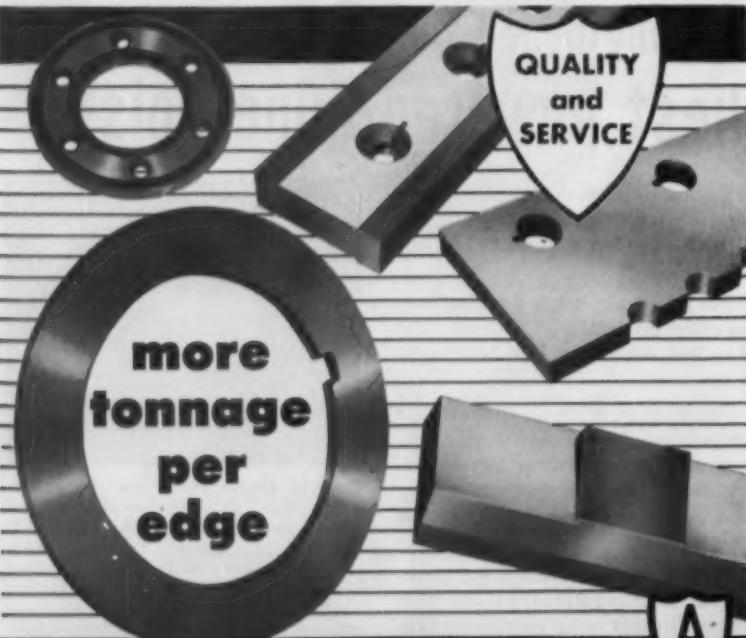
ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5209 W. Armstrong Ave.

Chicago 30, U.S.A.

Write for circular



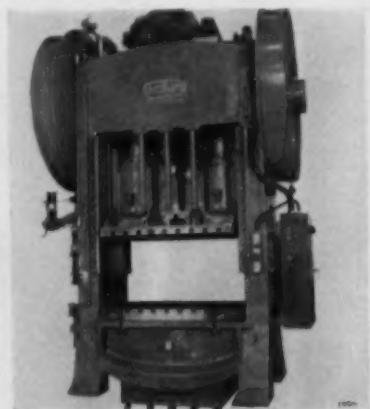
**AMERICAN
SHEAR KNIFE CO.**

HOMESTEAD, PENNSYLVANIA



Double crank press

A Cleveland double crank press, 200 tons capacity, has a bed area and slide area of 48 x 60 in., and a stroke of 12 in. The press, which is double geared, twin drive, is equipped with a single station electrically controlled air operated



drum type friction clutch. Slide and bolster are T slotted and the slide, which has power adjustment, is air counterbalanced. Lubrication system is centralized mechanically operated. Pneumatic cushion in bed has 6-in. travel; capacity of 40 tons at 100 lb air pressure. *Cleveland Punch & Shear Works Co.*

For more data circle No. 46 on postcard, p. 137.

Circular saw grinder

Low cost grinder provides circular saw users a unit for sharpening all types of circular saws—rip, crosscut or combination toothed—from 5 to 44 in. diam. Positive



settings provide correct pitch on all teeth as well as uniform tooth height, depth and bevel. Saw tilts to 45° both ways for bevel grinding. Pointer and graduated quadrant scales insure quick and accurate positioning. *Foley Mfg. Co.*

For more data circle No. 47 on postcard, p. 137.

NEW EQUIPMENT

Air-hydraulic booster

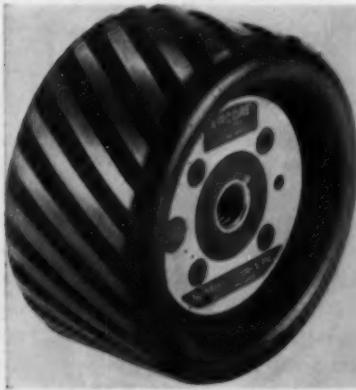
New, continuous-action, automatically reciprocating air-hydraulic booster is capable of delivering an unlimited amount of high pressure fluid for the operation of hydraulic cylinders. The booster operates from ordinary plant compressor air input and, offers operational



advantages and cost-savings in applications where large volumes of high pressure fluid are required. Essentially the booster consists of a double-rod end air cylinder with a hydraulic discharge pressure chamber at each end. It delivers a pressure output stroke in both directions. It is available in all ratios to give pressures to 10,000 psi and over. *Miller Fluid Power Co.* For more data circle No. 48 on postcard, p. 137.

Air-inflated grinders

Development of interchangeability in Nu-Matic air-inflated Aircore grinding wheels has been announced. Aircore drums will be standardized to fit standard cores, enabling users to stock a complete



line of wheels for a single core. A new Aircore model designated 525 has marked improvements in balance, operating speed and lightness. Exacting concentricity prevents wobble or chatter during grinding and insures better contact between wheel and work. *Nu-Matic Grinders, Inc.*

For more data circle No. 49 on postcard, p. 137.
Turn Page

SAVE!

WITH A HANNIFIN AIR PRESS

It's the ideal press for that occasional pressing job. These presses operate off ordinary shop air supply. They're fast and safe. Over 30 models to choose from...many for either bench or floor mounting. Capacities from $\frac{1}{2}$ to 18 tons. Daylight to 46 inches...reach to 12 inches. Prompt delivery.

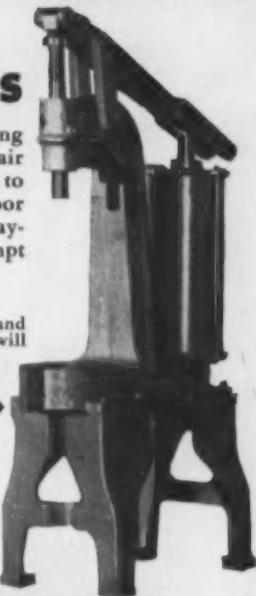


WRITE. Complete information and prices on Hannifin Air Presses will be sent on request.

6 Tons (Model B-2) One of more than 30 models. Press with base, \$554.

1-ton Hand-D-Press. For small parts manufacturers. Press, \$232.

Prices F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.



HANNIFIN

HANNIFIN CORPORATION. 513 S. WOLF ROAD, DES PLAINES, ILLINOIS

**MOTORIZED
COIL LIFTER**
SAVES
STORAGE SPACE...
HANDLES COILS FASTER... SAFER

1 Lifter Handles Both Wide and Narrow Coils With Same Speed and Economy



This C-F Coil Lifter, under control of the Crane operator handles hundreds of coils a day in a large mill... wide, narrow, and of varying tonnage. Fast, infinite adjustments of the motorized legs permit quick pick-up and set-down. Legs can be opened to any width and held... no need to open to maximum width to handle narrow coil. Maximum of 12" required between coils of any width—saves storage room.

Positive tong grip on coil tightens as lift is made... insures safe handling. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for Bulletin and complete information.

CULLEN-FRIESTEDT CO.

1303 South Kilbourn Avenue • Chicago 23, Illinois



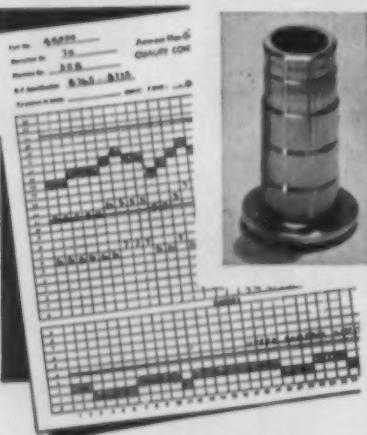
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PRODUCTION
OF
GREY IRON
CASTINGS

ONE OF THE
NATION'S LARGEST
AND MOST MODERN
PRODUCTION
FOUNDRIES

ESTABLISHED 1866

**THE WHELAND
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We'll machine it for you
under **STATISTICAL
QUALITY CONTROL**

Here at Non-Gran our contract machine work is performed under industry's newest approach to better products, at lower cost. Learn what this can mean to your product. Write!



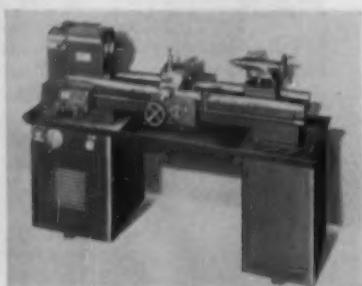
Write for book "Our Story in Pictures"

AMERICAN
NON-GRAN
BRONZE CO.
Berwyn, Pa.
Metropolitan Photo.

NEW EQUIPMENT

Toolroom lathe

New swing lathe with variable speed drive has a range of 38 to 1200 rpm. Principal specifications are 14½ in. swing over bed, 9-in.



swing over saddle, 1½ in. spindle hole, 1-in. collet capacity and 40 in. between centers. The lathe is designed for tool room, production and maintenance work. *Logan Engineering Co.*

For more data circle No. 58 on postcard, p. 137.

Jet flux

Automatic fluxing system for production and maintenance brazing operations meters liquid flux into the fuel gas according to size of brazing tip and regulator pressures. Ruggedly compact, simple and sized to carry a charge for a



work-week of brazing operations, it may be attached to the welder's hand truck or to the fuel line at the production brazing station. The system can be used for brazing carbon and low alloy steels, brass and copper base alloys, Monel and in surface silver brazing. *All-State Welding Alloys Co.*

For more data circle No. 51 on postcard, p. 137.

METAL
STAMPING
FACILITIES

by *Lansing*
at your Service for...

TRANSPORTATION
EQUIPMENT

HOUSEHOLD
APPLIANCES

ELECTRICAL
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Lansing Stamping Co.
ESTABLISHED 1914

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STAMPINGS
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PRODUCT



SEE SESSIONS... for Metal
Specialties, Box & Case Hard-
ware, Stamped Assemblies in
a wide range of finishes.

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290 RIVERSIDE AVENUE • BRISTOL, CONN.

NEW EQUIPMENT

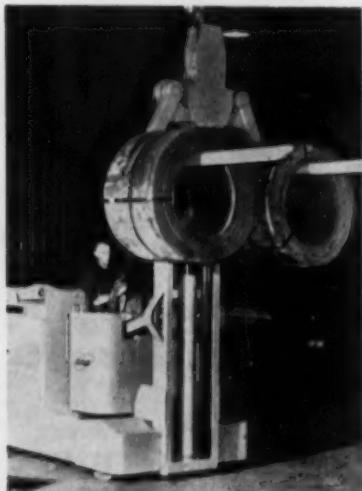
Double-suction pump

Developed for air conditioning and general purpose applications, a double-suction pump has a horizontally-split, cast iron casing, a bronze double-suction type impeller, well-sealed, grease-lubricated ball bearings, and deep but easily accessible stuffing boxes. It is offered in 5 sizes ranging from 3 x 2½ in., 1750 rpm, at 150-ft head to 6x6 in., at 100-ft head. *Allis-Chalmers Mfg. Co.*

For more data circle No. 52 on postcard, p. 137.

Split ram attachment

A 15,000-lb capacity industrial truck is equipped with a special hydraulic split ram which acts as a single ram or a pair of forks for



handling one large coil or two smaller coils, or packs of sheet. Attachment may be used with electric or gas-electric powered trucks and provides maximum flexibility in handling the coils and sheet packs. Single double-acting cylinder controlled from the operator's position powers the unit. Length of ram or height of lift can be altered to suit individual requirements. The truck illustrated is a non-telescoping, non-tilting model. Power steering is provided. The truck is engineered for maximum operator vision plus maneuverability; is constructed for the ruggedness required of steel mill operation. *Elwell-Parker Electric Co.*

For more data circle No. 53 on postcard, p. 137.

Silent Hoist gave you **KRANE KAR**, the first modern Mobile Crane . . . Front-Wheel Drive . . . Stability without Stabilizers . . . Lifetime Front Axle . . . Automatic Safety Controls. And now **Silent Hoist** gives you **FLUID DRIVE!**

- ✓ Increases engine clutch life.
- ✓ Provides cushioned starting and acceleration.
- ✓ Eliminates overload shock damage to drive gears.
- ✓ Speeds operation.
- ✓ Cuts maintenance drastically.

Ask for Bulletin No. 79C

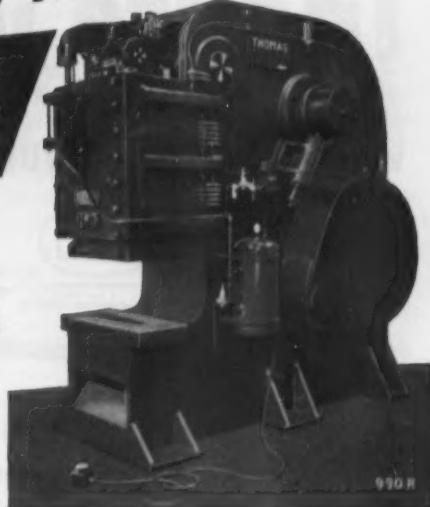
"Silent Hoist" KRANE KAR Swing-Boom Mobile Crane . . . 1½, 2½, 5, 10, 12½ Ton Capacities



THE TREND IS TO THOMAS
because of these
plus features!

Steel Plate Housing

- ✚ Cast Steel Cut Gearing
- ✚ Cast Steel Moving Parts
- ✚ Air Operated Clutch
- ✚ Air Counterbalance
- ✚ Quick Tool Changes

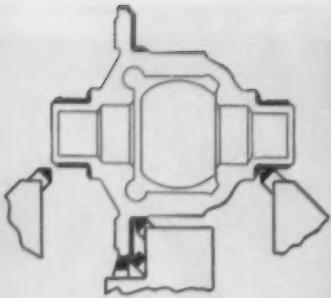


This Thomas All-Steel Punch or Shear has shearing or punching attachments which may be interchanged in a matter of minutes

**For rounds, squares, flats,
angles or channels**

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH (23), PA.

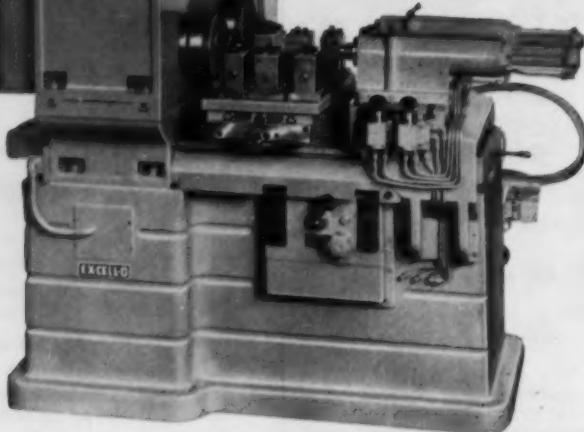
PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES



Heavy lines show the surfaces machined.



Style 112-C Ex-Cell-O Precision Boring Machine with double set-up.



Close-up of the two differential cases, in work position. This precision work is done with hydraulic feeds and easily-controlled automatic cycles.

Insure your Profits...

with DOUBLED PRODUCTION on Ex-Cell-O STANDARD MACHINES



A NEW APPROACH . . . Turn four diameters—face three shoulders—chamfer one edge. Not one at a time—but Two! Not on a double end—but on a single end Ex-Cell-O Precision Boring Machine!

Workpieces are automotive differential cases—precision work—limits of plus or minus .0005" on diameters.

See how Precision Boring Machines can save time and money for you. Call your local Ex-Cell-O representative, or phone or write Ex-Cell-O for a Precision Boring Catalog.

EX-CELL-O

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DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION
MACHINE TOOLS • GRINDING
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CRAFT AND MISCELLANEOUS
PRODUCTION PARTS •
DAIRY EQUIPMENT

The Iron Age SUMMARY...

Mounting pressure puts heavy burden on producers . . . Output nears all-time record . . . Consumers discuss conversion

Pressure Up . . . Mounting pressure for delivery is pushing steel producers against the wall. Some mills are lagging behind on delivery promises. Backlogs are building up. Production, processing, and shipping facilities are being strained to the utmost.

With the ingot rate already pushing toward capacity, seasonal market influences are increasing the pressure. Marginal production and finishing facilities are being used.

Mills this week were operating at 91 pct of capacity, a short skip and a jump from an expected 95-96 pct. Tonnage produced will be only 6 pct below the all-time weekly tonnage of 2,324,000 tons established during the week of March 23, 1953.

No Let Up . . . There seems to be no prospect of a letup in demand through first half. And many producers and consumers are changing their thinking over outlook for third quarter. Even if automotive sluffs off as some expect, the momentum of other markets is likely to carry over into third quarter. Additional last half support will come from inventory-building.

Steel consumers are becoming more anxious and more insistent upon prompt delivery. Most of them are confronted with a dual problem:

Keeping their own production lines going, and trying to rebuild their inventories.

The feverish pace of the steel market reflects a steady improvement in demand for virtually all products since turn of the year. In addition, the recent pickup has been overwhelming.

If the buildup continues, warehouses, already showing a definite though spotty improvement, may expect a sharp increase in business. A mild gray market may also be in the works as consumers are forced to buy emergency tonnages from other-than-mill sources at premium prices. Scattered deals of this sort have been made.

Conversion Near . . . Producers are receiving inquiries for possible conversion space. Some consumers have been offered conversion steel. A few such deals may be in the making.

The conversion route to steel tonnages may not be as promising as in the past. Steel ingot and finishing capacity are in better balance. Foreign consumers are draining heavy tonnages of semi-finished from U. S. mills. In earlier tight markets, the contrary was true—Europe was supplementing our supplies.

Steel Scrap Composite Price eased slightly on basis of a drop in the East.

Steel Output, Operating Rates

| Production (Net tons, 000 omitted) | This Week | Last Week | Month Ago | Year Ago |
|---------------------------------------|--------------|--------------|--------------|-------------|
| Ingot Index (1947-49 = 100) | 135.2 | 136.4 | 128.9 | 105.0 |
| Operating Rates | | | | |
| Chicago | 93.5 | 91.0 | 87.0 | 78.5 |
| Pittsburgh | 90.0 | 90.0* | 82.0 | 83.0 |
| Philadelphia | 84.0 | 84.0 | 84.0 | 67.0 |
| Valley | 87.0 | 89.0 | 85.0 | 65.0 |
| West | 90.0 | 92.5* | 88.0 | 70.0 |
| Detroit | 89.0 | 93.0 | 89.0 | 53.0 |
| Buffalo | 100.0 | 100.0 | 100.0 | 63.5 |
| Cleveland | 95.5 | 95.5* | 83.0 | 64.0 |
| Birmingham | 86.5 | 86.5 | 79.0 | 80.0 |
| S. Ohio River | 84.5 | 83.5* | 95.5 | 75.0 |
| Wheeling | 99.0 | 98.0* | 98.0 | 85.0 |
| St. Louis | 96.0 | 102.0 | 89.0 | 45.5 |
| Northeast | 87.0 | 87.0* | 56.5 | 53.0 |
| Aggregate | 91.0 | 91.0* | 85.0 | 70.5 |

*Revised. †Tentative

Prices At A Glance

| (cents per lb unless otherwise noted) | | | | |
|---------------------------------------|--------------|-------------|--------------|-------------|
| | This Week | Week Ago | Month Ago | Year Ago |
| Composite prices | | | | |
| Finished Steel, base | 4.797 | 4.797 | 4.797 | 4.634 |
| Pig Iron (Gross ton) | \$56.59 | \$56.59 | \$56.59 | \$56.59 |
| Scrap, No. 1 hvy (gross ton) | \$36.75 | \$37.00 | \$35.50 | \$23.83 |
| Nonferrous | | | | |
| Aluminum, ingot | 23.20 | 23.20 | 23.20 | 21.50 |
| Copper, electrolytic | 33.00 | 33.00 | 33.00 | 29.75 |
| Lead St. Louis | 14.80 | 14.80 | 14.80 | 12.30 |
| Magnesium, ingot | 27.75 | 27.75 | 27.75 | 27.75 |
| Nickel, electrolytic | 67.67 | 67.67 | 67.67 | 63.08 |
| Tin, Straits, N. Y. | 91.00 | 90.50 | 89.625 | 86.75 |
| Zinc, E. St. Louis | 11.50 | 11.50 | 11.50 | 9.25 |

STEEL PRODUCT MARKETS

Bars Join Market Upsurge

February bookings 10-15 pct over January with a record step-up in March looked for . . . Carbon, alloy bars share in the advance . . . More demand from warehouses, appliance, auto, supply firms.

• **BARS** are becoming more of a factor in the steel market. No longer a shrinking violet in the steel recovery, bars of all kinds are showing increasing strength and demanding an increasing share of the steel ingot. (See p. 77.)

Due to heavy inventories in warehouses and plants of automotive companies, bars had been improving, but slowly. In recent weeks, though, deliveries have become more extended and producers are talking about record production in March. February bookings were 10-15 pct above January, and a similar advance in March over February is looked for.

Hot-rolled and cold-finished carbon, alloy, stainless, and tool steel bars are sharing in the advance which seems to be based largely on warehouse, appliance, automotive and supplier companies, farm equipment manufacturers.

Bars thus become another of a growing list of products that may be classed as firm-to-strong, and another reason why consumers are finding it increasingly difficult to rebuild their inventories.

Although warehouse inventories are still good, distributors are beginning to see daylight. Their 1954 setback was unnerving, but some houses report a substantial recovery by mid-February with the upward trend continuing into March.

Stainless steel mills report an improving market for wire, bar, and plate, on top of a tight market in flat-rolled, where third quarter business is being booked.

Continental Steel Corp. announced an increase in price of its Galvannealed sheets from \$5.95 to \$6.20 per 100 lb, f.o.b. Kokomo, Ind.

Cleveland-Cliffs Iron Co. has put through a 20¢ per ton increase on the price of iron ore. Price hike is similar to Oliver Iron Mining Co.'s increase of a week ago. New prices are \$10.10 Mesabi non-bessemer ore and \$10.25 bessemer (per gross ton, rail or vessel) lower Lake ports. Marquette Range ore was increased 10¢ per ton to make a base price of \$10.25.

SHEETS AND STRIP . . . With first half a sell-out, some cold-rolled sheet consumers are trying to line up July, even August delivery. Hot-rolled sheet has moved into late May in Chicago, and is picking up steadily in other districts. Strip also continues to move out. Automotive and appliances are providing the big push behind flat-rolled, and the pressure is likely to continue through first half. Some producers feel shaky over the outlook beyond that, feeling that automotive demand will sluff off in second half.

BARS . . . Bar demand is coming into its own. Producers look for record production during March. Alloy bars are strong and expected to hold up through second quarter. Although order backlogs and delivery dates continue to advance, cold-finished bar producers are restraining their enthusiasm, remembering the bleak days of 1954 when shipments were only 58.6 pct of 1953's. Warehouse, automotive, farm equipment, and appli-

ances are giving the market a shot in the arm.

STRUCTURALS . . . Demand for wide flange beams continues strong. This market looks solid through second quarter. Standard structurals are improving slowly. A noticeable pickup in light standards reported from Pittsburgh and Chicago; Pittsburgh district mills are using about 80 pct of light standard capacity at the moment. Improvement reflects stepped-up ordering for highway and other construction.

PLATES . . . Beginning to feel preliminary effects of linepipe construction program. Mills are stocking plates to build inventory in anticipation of electricweld. Deliveries at 5-7 weeks in Chicago district even though linepipe ordering is not strong as yet.

WIRE . . . This product looks strong through first half and into third quarter. Farm ordering has strengthened the merchant wire market, and manufacturers' wire continues strong. Welding rod shows further improvement. Spring wire is picking up. Construction wire products going strong.

PIPE AND TUBING . . . Merchant pipe demand is gaining strength as construction requirements make themselves felt. In Chicago district, backlogs of 2-4 weeks are reported. Oil country goods going strong. Linepipe demand moving up toward an expected spring-summer peak.

GALVANIZED . . . Approach of another building season promises to strengthen demand for this product, which has been one of the tightest on the mill list. Deliveries are extended through first half and some consumers have been willing to make commitments for third quarter. Indications are that galvanized will continue tight even with the introduction of new capacity later this year.

STAINLESS . . . Demand from automotive, appliances, dairy, chemicals, and other industries is injecting new life into the stainless market. Bars and plates are now showing strength, joining sheets and strip which had picked up earlier.

WAREHOUSE . . . The warehouses are getting into the act. Market continues spotty but for the first time, distributors are definitely optimistic. Reports from Chicago, West Coast, Cleveland, and Pittsburgh, bear out predictions that the steel boom would shortly extend to warehouses, which had been overloaded with inventory.

Purchasing Agent's Checklist

| | |
|--|-------|
| STEEL: Inventory build up maintains demand | p. 75 |
| BARS: See new Sales records for March | p. 77 |
| ROADS: Industry can meet biggest steel demands | p. 78 |
| DIE CASTING: Boom business seen for 1955 | p. 82 |

Comparison of Prices

(Effective Mar. 1, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | Mar. 1 1955 | Feb. 22 1955 | Feb. 1 1955 | Mar. 2 1955 |
|---------------------------------------|----------------|-----------------|----------------|----------------|
| Flat-Rolled Steel: (per pound) | | | | |
| Hot-rolled sheets | 4.05¢ | 4.05¢ | 4.05¢ | 3.925¢ |
| Cold-rolled sheets | 4.05 | 4.05 | 4.05 | 4.775 |
| Galvanized sheets (10 ga.) | 5.45 | 5.45 | 5.45 | 5.275 |
| Hot-rolled strip | 4.05 | 4.05 | 4.05 | 3.925 |
| Cold-rolled strip | 5.79 | 5.79 | 5.79 | 5.513 |
| Plate | 4.225 | 4.225 | 4.225 | 4.19 |
| Plates wrought iron | 9.30 | 9.30 | 9.30 | 9.30 |
| Stainl's C-B strip (No. 302) | 41.50 | 41.50 | 41.50 | 41.50 |

Tin and Terplate: (per base box)

| | | | | |
|------------------------------|--------|--------|--------|--------|
| Tinplate (1.50 lb.) cokes | \$9.05 | \$9.05 | \$9.05 | \$8.95 |
| Tinplate, electro (0.50 lb.) | 7.75 | 7.75 | 7.75 | 7.65 |
| Special coated mfg. terres | 7.85 | 7.85 | 7.85 | 7.75 |

Bars and Shapes: (per pound)

| | | | | |
|--------------------------|-------|-------|-------|-------|
| Merchant bars | 4.30¢ | 4.30¢ | 4.30¢ | 4.16¢ |
| Cold-finished bars | 5.40 | 5.40 | 5.40 | 5.20 |
| Alloy bars | 5.075 | 5.075 | 5.075 | 4.875 |
| Structural shapes | 4.25 | 4.25 | 4.25 | 4.10 |
| Stainless bars (No. 302) | 35.50 | 35.50 | 35.50 | 35.50 |
| Wrought iron bars | 10.40 | 10.40 | 10.40 | 10.40 |

Wire: (per pound)

| | | | | |
|-------------|-------|-------|-------|--------|
| Bright wire | 5.75¢ | 5.75¢ | 5.75¢ | 5.525¢ |
|-------------|-------|-------|-------|--------|

Rails (per 100 lb.)

| | | | | |
|-------------|--------|--------|--------|---------|
| Heavy rails | \$4.45 | \$4.45 | \$4.45 | \$4.325 |
| Light rails | 5.35 | 5.35 | 5.35 | 5.20 |

Semifinished Steel: (per net ton)

| | | | | |
|------------------------------|---------|---------|---------|---------|
| Rerolling billets | \$64.00 | \$64.00 | \$64.00 | \$62.00 |
| Slabs, rerolling | 64.00 | 64.00 | 64.00 | 62.00 |
| Forging billets | 78.00 | 78.00 | 78.00 | 75.50 |
| Alloy blooms, billets, slabs | 86.00 | 86.00 | 86.00 | 82.00 |

Wire Rod and Skelp: (per pound)

| | | | | |
|-----------|--------|--------|--------|--------|
| Wire rods | 4.675¢ | 4.675¢ | 4.675¢ | 4.525¢ |
| Skelp | 3.90 | 3.90 | 3.90 | 3.75 |

Finished Steel Composite: (per pound)

| | | | | |
|------------|--------|--------|--------|--------|
| Base price | 4.797¢ | 4.797¢ | 4.797¢ | 4.684¢ |
|------------|--------|--------|--------|--------|

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

PIG IRON

Dollars per gross ton, f.o.b.,
subject to switching charges.

← To identify producers, see Key on P. 199 →

STAINLESS STEEL

Basis price cents per lb. f.o.b. mill

| Producing Point | Basic | Fdry. | Mall. | Bess. | Low Phos. |
|-----------------|--------|--------|--------|--------|-----------|
| Bethlehem B3 | \$8.00 | \$8.50 | \$9.00 | \$9.50 | |
| Birmingham R3 | \$2.38 | \$2.88 | | | |
| Birmingham W9 | \$2.38 | \$2.88 | | | |
| Birmingham U4 | \$2.38 | \$2.88 | | | |
| Buffalo R3 | \$6.00 | \$6.50 | \$7.00 | | |
| Buffalo I11 | \$6.00 | \$6.50 | \$7.00 | | |
| Buffalo W6 | \$6.00 | \$6.50 | \$7.00 | | |
| Chicago 14 | \$6.00 | \$6.50 | \$6.50 | \$7.00 | |
| Cleveland A5 | \$6.00 | \$6.50 | \$6.50 | \$7.00 | \$1.00 |
| Cleveland R3 | \$6.00 | \$6.50 | \$6.50 | \$7.00 | |
| Doingsfield L3 | \$2.50 | \$2.50 | \$2.50 | | |
| Duluth 14 | \$6.00 | \$6.50 | \$6.50 | \$7.00 | |
| Erie 14 | \$6.00 | \$6.50 | \$6.50 | \$7.00 | |
| Everett M6 | \$1.00 | \$1.00 | | | |
| Fontana K1 | \$2.00 | \$2.50 | | | |
| Geneva, Utah C7 | \$6.00 | \$6.50 | | | |
| Granite City G2 | \$7.00 | \$8.40 | \$8.80 | | |
| Hubbard Y1 | | | | | |
| Minneapolis C6 | \$8.00 | \$9.00 | \$9.00 | | |
| Massillon P6 | \$8.00 | | | | |
| Neville Is. P9 | \$8.00 | \$8.50 | \$8.50 | | |
| N. Tonawanda T1 | | | | | |
| Pittsburgh U1 | \$6.00 | | | | |
| Sharpen S1 | \$6.00 | \$6.50 | \$6.50 | \$7.00 | |
| Sa. Chicago R3 | \$6.00 | | | | |
| Steeler B3 | \$6.00 | \$8.50 | \$9.00 | \$9.50 | \$4.00 |
| Sweden A2 | \$8.00 | \$8.50 | \$9.00 | \$9.50 | |
| Toledo I4 | \$6.00 | \$6.50 | \$6.50 | \$7.00 | |
| Troy, N. Y. R3 | \$8.00 | \$8.50 | \$9.00 | \$9.50 | \$4.00 |
| Youngstown Y1 | | | | | |

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct); 50¢ per ton for each 0.50 pct manganese over 1 pct; \$2 per ton for 0.5 to 0.75 pct nickel; \$1 for each additional, 0.25 pct nickel. Subtract 3¢ per ton for phosphorus content 0.70 and over.

Silvery iron: Buffalo, H1, \$46.25; Jackson, J1, G1, \$45.00. Add \$1.00 per ton for each 0.50 pct silicon over base (0.60 to 0.65 pct) up to 17 pct. Add \$1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are \$1 over comparable silvery iron.

| Product | 301 | 302 | 303 | 304 | 316 | 321 | 347 Cb | 410 | 416 | 430 |
|--------------------------------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| Ingots, rerolling | 16.75 | 17.75 | 19.25 | 19.00 | 29.75 | 23.50 | 35.50 | 14.00 | — | 14.25 |
| Slabs, billets, rerolling | 21.00 | 22.25 | 25.25 | 24.50 | 38.00 | 30.25 | 46.75 | 18.25 | — | 18.5 |
| Forg. discs, die blocks, rings | 39.00 | 39.00 | 42.00 | 41.25 | 61.75 | 46.25 | — | 31.00 | 31.75 | 31.7 |
| Billets, forging | 30.00 | 36.25 | 32.75 | 31.75 | 48.25 | 36.00 | 54.75 | 24.00 | 24.50 | 24.5 |
| Bars, wires, structural | 35.75 | 36.00 | 38.75 | 38.00 | 57.25 | 42.75 | 64.25 | 28.75 | 29.25 | 29.2 |
| Plates | 37.75 | 38.00 | 40.25 | 40.50 | 60.50 | 46.50 | 69.25 | 38.00 | 38.50 | 38.5 |
| Sheets | 41.75 | 42. | 49.25 | 44.50 | 64.50 | 51.25 | 77.50 | 34.25 | 41.25 | 34.7 |
| Strip, hot-rolled | 30.25 | 32.50 | 37.25 | 35.00 | 55.00 | 41.75 | 63.00 | 26.25 | — | 27.0 |
| Strip, cold-rolled | 38.75 | 42.00 | 46.00 | 44.50 | 64.50 | 51.25 | 77.50 | 34.25 | 41.25 | 34.75 |

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C1; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J2; Birmingham, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Philadelphia, D5.

Strip: Midland, Pa., C1; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., J2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C1; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (25¢ per lb higher) W1 (25¢ per lb higher); New Bedford, Mass., R6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C1; Watervliet, N. Y., A3; Waukegan, A3; Canton, O., T3; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C1; Bridgeville, U2.

Structural: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C1.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C1; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Cesterville, Pa., C1; Philadelphia, D5.

Forged discs, die blocks, rings: Pittsburgh, C1; Syracuse, C1; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C1; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C1.

Eastern Market Off Slightly

Concern over possible export controls worries brokers . . . Buying for export slows in Philadelphia, New York . . . Foundry buying strengthens Chicago market.

♦ CONCERN over the possibility that the government may find it necessary to set up controls on the exports of steelmaking scrap led at least one large eastern broker to curtail buying for export temporarily at least.

Prices of No. 1 heavy melting in both Philadelphia and New York markets softened as a result of decline in purchasing. In Pittsburgh and the Midwest the market continued strong although there were no changes in the prices of open-hearth grades. Strong foundry buying in Chicago strengthened that market in railroad specialties and cast grades.

On the basis of the eastern price decline in No. 1 steel scrap, THE IRON AGE Heavy Melting Steel Scrap Composite eased to \$36.75 per gross ton.

Pittsburgh . . . Market remains strong. Blast furnace grades were advanced \$1 per ton on the basis of broker buying. A tonnage of industrial bundles was sold on bids ranging from \$39.50 to \$40.25 per ton. A consumer on the fringe of the district has purchased a small tonnage of dealer scrap in line with current prices. This mill generally fulfills the bulk of its requirements with industrial scrap.

Chicago . . . Paced by strong foundry buying, Chicago's scrap market was beginning to move up again last week, with railroad specialties and cast grades showing advances. Steelmaking, electric furnace, and blast furnace grades were hanging fire but evidence of an uptrend was strengthening prices at the dealer level. It has been generally agreed that recent purchases by mills at lower levels in steelmaking grades were not telling the entire market story. Advancing broker buying prices are a truer indication of the market. Dealer sales of \$18.50 to a broker holding a \$19

turnings order, No. 1 dealer bundles moving at \$33.50, No. 2 heavy melting moving at \$31.50, prove that Chicago, like Pittsburgh, isn't burdened with scrap, and that the still advancing operating rate is chewing up yard stocks. New price increases in nearby areas, including Detroit, had failed to affect consumer prices at press time.

Philadelphia . . . Dealers and exporters are concerned over the possibility that government may institute controls over scrap exports. Reports are that a leading district broker has withdrawn from the buying picture. One large producer, now buying at most recent price level, may buy at lower price level on next purchase.

New York . . . In response to reports that a leading eastern broker has suspended export buying, at least until the government position on exports is clarified, price of openhearth grades declined \$1. Domestic market continues improvement.

Detroit . . . Scrap market is undergoing an uneasy period, waiting for final buying decisions by mills and brokers. Despite record-breaking tonnages of scrap being generated, industrial lists were up \$1 or more last week. However, up to press time, dealers had no orders to confirm the rising market trend, but there was every expectation that mill buying, if any, would be at higher than the previous prices.

Cleveland . . . Valley market went up \$1 on No. 1 heavy melting and bundles last week on basis of sale at \$38 with restricted shipping points. Another Valley mill paid 50¢ over this figure for special specifications. Some scrap normally flowing northward into Valley from south Ohio River district now believed going elsewhere. In Cleveland, blast furnace scrap went up \$1 on basis of another restricted shipping point sale. Stove plate showed some life with \$2 rise, mostly for foundry pickup for plumb-

ing fixture market. Export market believed extending its repercussions all the way into Cleveland last week. Heavy tonnage of bundles normally shipped from Detroit into Cleveland being held in Detroit for Canada for either domestic use or export when Lakes shipping season opens in another month.

Birmingham . . . Steel scrap is moving well in the district at increased prices announced last week. Some dealers, however, anticipating further increases, are accepting orders for only a limited amount. One Southern mill is offering a \$2 premium for scrap from remote areas in a bid against exports. Some grades made additional gains this week. The east market continues strong.

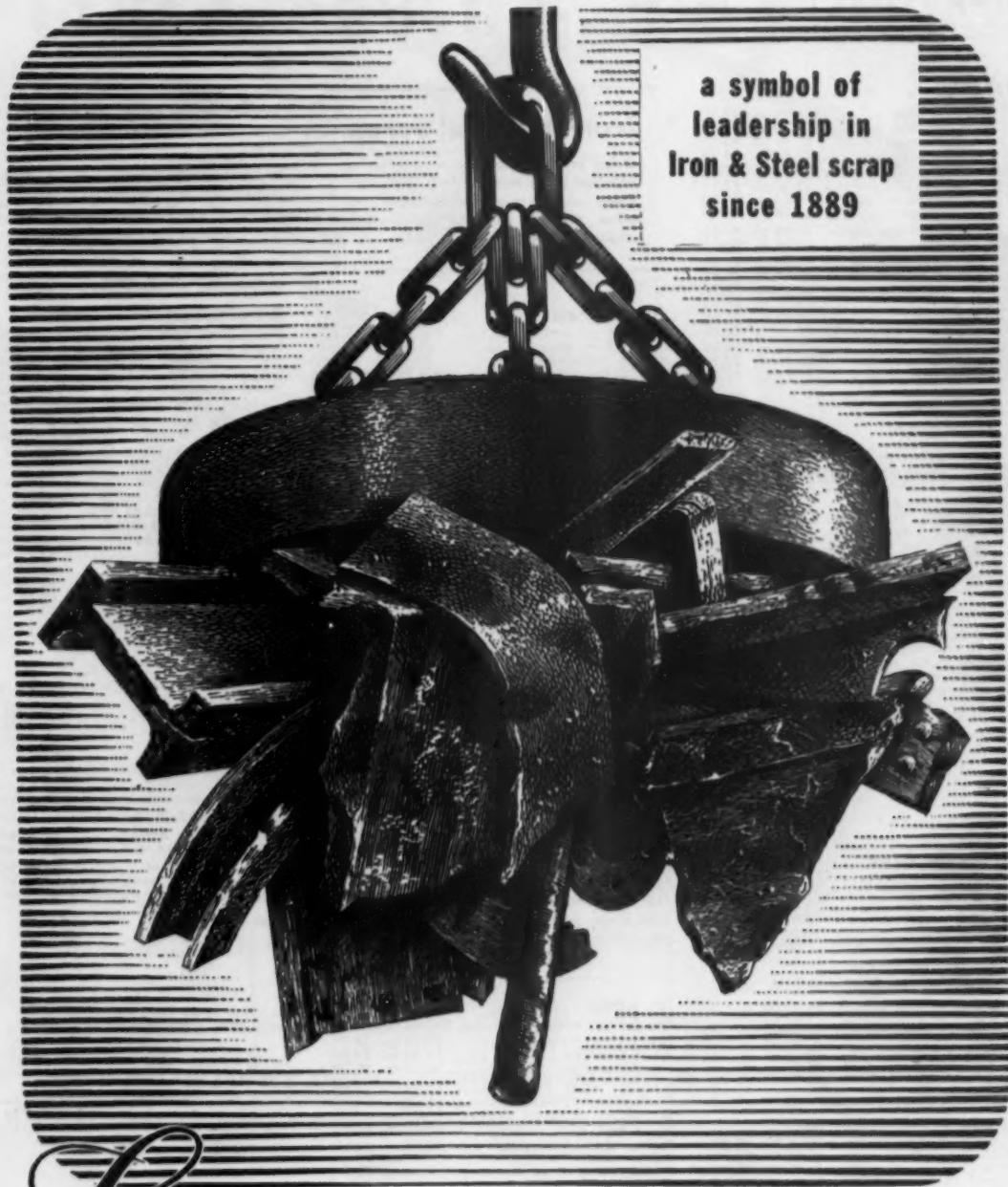
St. Louis . . . Steel mill purchases for March are expected to be on the same price levels as now prevail and of sufficient tonnage to equal melt. Flow of scrap continues steady. Prices are unchanged. A Texas purchase of No. 2 steel, freight \$4 and under, was at \$30.50 and not at the \$34.50 that had been mentioned.

Cincinnati—A heavy buyer in Cincinnati trading area upped monthly price \$2.50 on most grades for March, paying \$34.50 delivered for No. 1 heavy melting. Some tonnage to be barged to Pittsburgh was reported cancelled.

Buffalo . . . A firmer trend rules the market here as low phos jumped \$1.50 a ton and top quality steel grades edged ahead an additional 50¢ on local buying. Outside strength continues to be a major factor. The trade is anxiously awaiting prices on new orders from the district's top mill, which are expected within the week.

Boston . . . A good solid market continues to characterize New England scrap trading. Prices on steelmaking and blast furnace grades are quoted higher again this week with jumps of \$1 to \$2 in openhearth material and \$3 in electric furnace scrap for local use.

West Coast . . . There's strong export activity, with shipments leaving San Francisco, Los Angeles, and Pacific Northwest ports. Scrap supply is plentiful. Prices firmed up in San Francisco, but the market for top grades is fluid in Los Angeles and Seattle. March mill commitments could change the picture next week.



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Iron & Steel scrap
since 1889

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LINCOLN-LIBERTY BLDG.

Philadelphia 7, Penna.

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READING, PENNA. MICHIGAN
MORENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

| | | |
|-------------------|-------------------|---------------------|
| BIRMINGHAM, ALA. | DETROIT, MICHIGAN | PITTSBURGH, PENNA. |
| BOSTON, MASS. | HOUSTON, TEXAS | PUEBLO, COLORADO |
| BUFFALO, N. Y. | LEBANON, PENNA. | READING, PENNA. |
| CHICAGO, ILLINOIS | LOS ANGELES, CAL. | ST. LOUIS, MO. |
| CLEVELAND, OHIO | NEW YORK, N. Y. | SAN FRANCISCO, CAL. |
| | | SEATTLE, WASH. |

Scrap Prices (Effective Mar. 1, 1955)

Pittsburgh

| | |
|----------------------------|--------------------|
| No. 1 hvy. melting | \$35.00 to \$39.00 |
| No. 2 hvy. melting | \$35.00 to \$36.00 |
| No. 1 bundles | \$35.00 to \$39.00 |
| No. 2 bundles | \$35.00 to \$36.00 |
| Machine shop turn. | 21.50 to 22.50 |
| Mixed bor. and ms. turn. | 21.50 to 22.50 |
| Shoveling turnings | 25.50 to 26.50 |
| Cast iron borings | 25.50 to 26.50 |
| Low phos. punch'gs, plate. | 41.00 to 42.00 |
| Heavy turnings | 35.00 to 36.00 |
| No. 1 RR. hvy. melting | 40.00 to 41.00 |
| Scrap rails, random lgth. | 46.00 to 47.00 |
| Rails 3 ft and under | 50.00 to 51.00 |
| RR. steel wheels | 44.00 to 45.00 |
| RR. spring steel | 44.00 to 45.00 |
| RR. couplers and knuckles | 44.00 to 45.00 |
| No. 1 machinery cast | 42.00 to 44.00 |
| Cupola cast | 38.00 to 39.00 |
| Heavy breakable cast | 34.00 to 35.00 |

Chicago

| | |
|----------------------------|--------------------|
| No. 1 hvy. melting | \$32.00 to \$34.00 |
| No. 2 hvy. melting | \$31.00 to \$32.00 |
| No. 1 factory bundles | \$35.00 to \$36.00 |
| No. 1 dealers' bundles | \$35.00 to \$34.00 |
| No. 2 dealers' bundles | \$34.00 to \$35.00 |
| Machine shop turn. | 16.00 to 17.00 |
| Mixed bor. and turn. | 18.00 to 19.00 |
| Shoveling turnings | 18.00 to 19.00 |
| Cast iron borings | 18.00 to 19.00 |
| Low phos. forge crops | 33.00 to 39.00 |
| Low phos. punch'gs, plate | 36.00 to 37.00 |
| Low phos. 3 ft and under | 35.00 to 36.00 |
| No. 1 RR. hvy. melting | 36.00 to 37.00 |
| Scrap rails, random lgth. | 39.00 to 40.00 |
| Rerolling rails | 49.00 to 50.00 |
| Rails 3 ft and under | 48.00 to 49.00 |
| Locomotive tires, cut | 36.00 to 37.00 |
| Cut bolsters & side frames | 37.00 to 38.00 |
| Angles and splice bars | 48.00 to 44.00 |
| RR. steel car axles | 42.00 to 43.00 |
| RR. couplers and knuckles | 39.00 to 40.00 |
| No. 1 machinery cast | 45.00 to 46.00 |
| Cupola cast | 40.00 to 41.00 |
| Heavy breakable cast | 34.00 to 35.00 |
| Cast iron brake shoes | 34.00 to 35.00 |
| Cast iron car wheels | 36.00 to 37.00 |
| Malleable | 44.00 to 45.00 |
| Stove plate | 35.00 to 36.00 |

Philadelphia Area

| | |
|--------------------------|--------------------|
| No. 1 hvy. melting | \$38.00 to \$38.50 |
| No. 2 hvy. melting | \$34.00 to \$35.00 |
| No. 1 bundles | \$38.00 to \$38.50 |
| No. 2 bundles | \$39.50 to \$30.50 |
| Machine shop turn. | 21.50 to 22.50 |
| Mixed bor. short turn. | 21.50 to 22.50 |
| Cast iron borings | 20.50 to 21.50 |
| Shoveling turnings | 23.50 to 25.00 |
| Clean cast chem. borings | 27.00 to 28.00 |
| Low phos. 5 ft and under | 40.00 to 41.00 |
| Low phos. 3 ft and under | 43.00 to 43.90 |
| Low phos. punch'gs | 43.00 to 43.00 |
| Elec. furnace bundles | 39.00 to 40.00 |
| Heavy turnings | 36.00 to 37.00 |
| RR. steel wheels | 41.50 to 42.50 |
| RR. spring steel | 41.00 to 42.00 |
| Rails 18 in. and under | 51.00 to 52.00 |
| Cupola cast | 36.00 to 38.00 |
| Heavy breakable cast | 38.00 to 39.00 |
| Cast iron car wheels | 44.00 to 45.00 |
| Malleable | 44.00 to 45.00 |
| Unstripped motor blocks | 37.00 to 38.00 |
| No. 1 machinery cast | 44.00 to 45.00 |
| Charging box cast | 35.00 to 36.00 |

Cleveland

| | |
|--------------------------------------|--------------------|
| No. 1 hvy. melting | \$33.50 to \$34.50 |
| No. 2 hvy. melting | \$36.00 to \$31.00 |
| No. 1 bundles | \$33.50 to \$34.50 |
| No. 2 bundles | \$37.00 to \$38.00 |
| No. 1 busheling | \$38.50 to \$34.50 |
| Machine shop turn. | 18.00 to 19.00 |
| Mixed bor. and turn. | 22.00 to 25.00 |
| Shoveling turnings | 23.00 to 25.00 |
| Cast iron borings | 23.00 to 25.00 |
| Cut struct'ls & plates, 3 ft & under | 39.00 to 40.00 |
| Drop forge flashings | 35.50 to 34.50 |
| Low phos. punch'gs, plate | 33.50 to 34.50 |
| Foundry steel, 3 ft & under | 37.00 to 38.00 |
| No. 1 RR. heavy melting | 24.00 to 25.00 |
| Rails 2 ft and under | 47.00 to 48.00 |
| Rails 18 in. and under | 49.00 to 50.00 |
| Railroad grates bars | 27.00 to 28.00 |
| Steel axle turnings | 37.00 to 38.00 |
| Railroad cast. | 16.00 |
| No. 1 machinery cast | 45.00 to 46.00 |
| Stove plate | 41.50 to 42.50 |
| Malleable | 44.00 |

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

| | |
|--------------------|--------------------|
| No. 1 hvy. melting | \$37.00 to \$38.00 |
| No. 2 hvy. melting | 34.00 to 35.00 |
| No. 1 bundles | 37.00 to 38.00 |
| No. 2 bundles | 28.00 to 29.00 |
| Machine shop turn. | 26.00 |
| Shoveling turnings | 26.00 |
| Cast iron borings | 26.00 |
| Low phos. plate | 37.00 to 38.00 |

Buffalo

| | |
|---------------------------|--------------------|
| No. 1 hvy. melting | \$32.00 to \$32.50 |
| No. 2 hvy. melting | 27.50 to 28.50 |
| No. 1 busheling | 32.00 to 33.00 |
| No. 1 bundles | 32.00 to 32.50 |
| No. 2 bundles | 26.50 to 26.50 |
| Machine shop turn. | 19.00 to 20.00 |
| Mixed bor. and turn. | 20.50 to 21.50 |
| Shoveling turnings | 21.50 to 22.50 |
| Cast iron borings | 20.50 to 21.50 |
| Low phos. plate | 35.00 to 36.00 |
| Scrap rails, random lgth. | 35.00 to 39.00 |
| Rails 18 in. and under | 42.00 to 43.00 |
| Angles & splice bars | 39.00 to 40.00 |
| Rerolling rails | 43.00 to 44.00 |
| No. 1 cupola cast | 45.00 to 46.00 |
| Stove plate | 42.00 to 43.00 |
| Charging box cast | 21.00 to 23.00 |
| Cast iron car wheels | 33.00 to 34.00 |
| Unstripped motor blocks | 36.50 to 36.50 |
| Mashed tin cans | 16.00 to 16.00 |

New York

| | |
|---|------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$32.00 |
| No. 2 hvy. melting | 29.00 |
| No. 2 bundles | \$24.50 to 25.50 |
| Machine shop turn. | 11.00 to 12.00 |
| Mixed bor. and turn. | 12.00 to 12.00 |
| Shoveling turnings | 14.00 to 15.00 |
| Clean cast chem. borings | 23.00 to 23.00 |
| No. 1 machinery cast | 35.00 to 36.00 |
| Mixed yard cast | 29.00 to 30.00 |
| Charging box cast | 29.00 to 29.00 |
| Heavy breakable cast | 28.00 to 29.00 |
| Unstripped motor blocks | 23.00 to 23.00 |

Birmingham

| | |
|-----------------------------|--------------------|
| No. 1 hvy. melting | \$30.00 to \$31.00 |
| No. 2 hvy. melting | 27.00 to 28.00 |
| No. 1 bundles | 30.00 to 31.00 |
| No. 2 bundles | 23.00 to 24.00 |
| No. 1 busheling | 30.00 to 31.00 |
| Machine shop turn. | 17.00 to 18.00 |
| Shoveling turnings | 21.00 to 22.00 |
| Cast iron borings | 15.00 to 16.00 |
| Electric furnace bundles | 12.00 to 13.00 |
| Bar crops and plate | 36.00 to 37.00 |
| Structural and plate, 2 ft. | 36.00 to 37.00 |
| No. 1 RR. hvy. melting | 35.00 to 36.00 |
| Scrap rails, random lgth. | 31.00 to 39.00 |
| Rails, 18 in. and under | 42.00 to 43.00 |
| Angles & splice bars | 39.00 to 40.00 |
| Rerolling rails | 43.00 to 44.00 |
| No. 1 cupola cast | 45.00 to 46.00 |
| Stove plate | 42.00 to 43.00 |
| Charging box cast | 21.00 to 23.00 |
| Cast iron car wheels | 33.00 to 34.00 |
| Unstripped motor blocks | 36.50 to 36.50 |
| Mashed tin cans | 16.00 to 16.00 |

Cincinnati

| | |
|---|--------------------|
| Brokers buying prices per gross ton, on cars: | |
| No. 1 hvy. melting | \$32.00 to \$33.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 bundles | 32.00 to 33.00 |
| No. 2 bundles | 24.00 to 25.00 |
| Machine shop turn. | 17.00 to 18.00 |
| Mixed bor. and turn. | 18.00 to 19.00 |
| Shoveling turnings | 19.00 to 20.00 |
| Cast iron borings | 18.00 to 19.00 |
| Low phos. 18 in. & under | 36.00 to 37.00 |
| Rails, random lengths | 40.00 to 41.00 |
| Rails, 18 in. and under | 47.00 to 48.00 |
| No. 1 cupola cast | 39.00 to 40.00 |
| Hvy. breakable cast | 34.00 to 35.00 |
| Drop broken cast | 44.00 to 45.00 |

San Francisco

| | |
|------------------------|---------|
| No. 1 hvy. melting | \$27.00 |
| No. 2 hvy. melting | 25.00 |
| No. 1 bundles | 26.00 |
| No. 2 bundles | 22.00 |
| No. 3 bundles | 18.00 |
| Machine shop turn. | 6.00 |
| Cast iron borings | 9.00 |
| No. 1 RR. hvy. melting | 27.00 |
| No. 1 cupola cast | 40.00 |

St. Louis

| | |
|-------------------------|--------------------|
| No. 1 hvy. melting | \$31.00 to \$33.00 |
| No. 2 hvy. melting | 29.00 to 30.00 |
| No. 1 bundles | 30.00 to 31.00 |
| No. 2 bundles | 26.00 to 27.00 |
| No. 3 bundles | 24.50 to 25.50 |
| Machine shop turn. | 15.50 to 16.50 |
| Cast iron borings | 15.50 to 16.50 |
| Shoveling turnings | 17.00 to 18.00 |
| Cast iron borings | 18.00 to 19.00 |
| No. 1 RR. hvy. melting | 35.00 to 36.00 |
| Rails, random lengths | 40.00 to 41.00 |
| Rails, 18 in. and under | 47.00 to 48.00 |
| Locomotive, tires uncut | 35.50 to 36.50 |
| Angles and splice bars | 35.50 to 36.50 |
| Std. steel car axles | 35.50 to 36.50 |
| RR. spring steel | 37.00 to 38.00 |

| | |
|-------------------------|----------------|
| Cupola cast | 42.00 to 43.00 |
| Hvy. breakable cast | 33.00 to 34.00 |
| Cast iron brake shoes | 30.00 to 30.00 |
| Stove plate | 34.00 to 35.00 |
| Cast iron car wheels | 34.50 to 35.50 |
| Malleable | 35.00 to 36.00 |
| Unstripped motor blocks | 32.50 to 33.50 |

| | |
|-----------------------------|---|
| Boston | Brokers buying prices per gross ton, on cars: |
| No. 1 hvy. melting | \$28.00 to \$30.00 |
| No. 2 hvy. melting | 24.00 to 26.00 |
| No. 1 bundles | 27.00 to 29.00 |
| No. 2 bundles | 22.00 to 23.00 |
| No. 3 bundles | 18.00 to 20.00 |
| Machine shop turn. | 8.00 |
| Shoveling turnings | 10.00 |
| Cast iron borings | 10.00 |
| Elec. furn. 1 ft. and under | 28.00 to 30.00 |
| No. 1 RR. hvy. melting | 28.00 to 30.00 |
| No. 1 cupola cast | \$41.00 to 42.00 |

Seattle

| | |
|--------------------|---------|
| No. 1 hvy. melting | \$31.00 |
| No. 2 hvy. melting | 27.00 |
| No. 1 bundles | 21.00 |
| No. 2 bundles | 20.00 |
| No. 3 bundles | 15.00 |
| No. 1 cupola cast | 35.00 |
| Mixed yard cast | 35.00 |

Hamilton, Ont.

| | |
|---------------------------|----------------|
| No. 1 hvy. melting | \$32.00 |
| No. 2 hvy. melting | 29.00 |
| No. 1 bundles | 32.00 |
| No. 2 bundles | 28.00 |
| No. 3 bundles | 26.00 |
| Mixed steel scrap | 26.00 |
| Bushelings | 27.00 |
| Bush., new fact prep'd. | 30.00 |
| Bush., new fact unprep'd. | 26.00 |
| Short steel turnings | 12.00 |
| Mixed cupola cast | 27.00 to 28.00 |
| Heavy breakable cast | 26.00 to 27.00 |
| Stove plate | 25.00 to 26.00 |
| Unstripped motor blocks | 18.00 to 19.00 |

CIRCA 600 B.C.



Under the feet of a sphinx at Karnak, Egypt, Giovanni Belzoni, Italian traveler and explorer of the early 19th Century, discovered a sickle wrought of iron—supposed to have been placed there at least 600 years before the Christian era.

The sickle, oldest of reaping instruments, has given way in most parts of the world, first to the cradle, and now to mowing and reaping machines.

These modern tools of agriculture—of industry, transportation, construction, and the military—demand iron and steel in millions of tons. And scrap is an indispensable ingredient.

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Release 8000 Tons of Copper

U. S. to distribute metal bought under Defense Production Act . . . Won't release stockpile copper or divert stockpile shipments . . . Dems plan metal probe—by R. L. Hartschek.

◆ DEMOCRATS hinted around election time that they'd do a lot of probing into what went on while the Republicans were in control. They're holding to that promise.

As a part of this probe program, a subcommittee of the House is readying what it terms a full-scale investigation of the distribution and allocations systems and ownership of some segments of the metals industry.

Headed by Rep. Sidney Yates (D., Ill.), the subcommittee aims to investigate industrial allocation of copper and nickel and ownership in the nickel industry. Rep. Yates seems to have been misled somewhere along the way, for he intends also to investigate why scrap copper and brass exports were recently limited while export of new copper was not limited.

The fact is that export of domestic primary copper wasn't just limited—it was forbidden. Only new copper export that is now permitted is export of copper refined from foreign ores or concentrates.

Further evidence of his naivete is his statement that it is "apparent that these supplies (copper) are being allocated, not by any public agency, but by some private allocation methods of the three or four big companies which control virtually all of the supply in this country."

COPPER . . . Government is releasing to industry 8000 tons of copper from stocks purchased under the Defense Production Act (designed to help marginal facilities stay in production and to assure continued expansion of the industry). However, no copper is being released from the strategic stockpile, nor will shipments for the stockpile be diverted, Office of Defense Mobilization has stated. Terms of the release call for GSA to sell on the basis of need and hardship all copper inventories accumulated under the Defense Production Act and all shipments scheduled to that inventory through March.

For hard-pressed copper users, however, this latest government action though gratefully received actually still doesn't go far enough.

TITANIUM . . . Add another pri-

mary producer to the titanium list. Cramet, Inc., subsidiary of the Crane Co. jumped off with its initial commercial production in January. The Chattanooga plant, with facilities about 50 pct complete, will get into its full 6000-ton-per-year clip sometime next year. First sales of titanium sponge have already been made.

Cramet plans to market commercially pure and alloy ingots as well as sponge but mill products do not enter the picture—as yet.

Also installed at the Chattanooga facility is a control plant, essentially a scaled down version of the commercial equipment.

ALUMINUM . . . Biggest feature of the aluminum market this week was a healthy hop in secondary ingot prices. The jump of 2¢ to 3¢ per lb on various grades just about equals the total gains made throughout the past month. Price situation is actually somewhat confused, with price spreads of up to 3.5¢ per lb at press-time. It is anticipated, however, that the low end of the range will disappear and the spread will narrow upward.

Naturally, this has had its usual effect on scrap prices—which are every bit as variable as the ingot quotations.

Primary market is also hot. And one of the things that adds to the heat is inventory buying. In this respect at least, the aluminum market is practically identical to the steel market (See p. 75). Consumers let their stocks slip too far in last year's dip. And now that demand has perked up, there are definite attempts to bolster plant inventories.

LEAD-ZINC . . . Hue and cry for additional federal aid to lead and zinc miners continues in Washington with the formation of a bi-partisan congressional committee. Chairman of the House group is Rep. William A. Dawson (R., Utah). Members seem generally agreed that President Eisenhower's "new look" stockpiling program, launched last June, has proved inadequate. They feel additional tariff protection is needed.

Their stated aim is to bind the lead-zinc mining industry to some sort of defense program. They feel the mines should be kept, at very least, in standby condition in preparation for any possible emergency.

Day to day markets continued without great change in both metals. Lead buying seems to have picked up a bit last week and zinc consumers are maintaining steady demand.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

| | Feb. 23 | Feb. 24 | Feb. 25 | Feb. 26 | Feb. 28 | Mar. 1 |
|------------------------|---------|---------|---------|---------|---------|--------|
| Copper, electro, Conn. | 33.00 | 33.00 | 33.00 | 33.00 | 33.00 | 33.00 |
| Copper Lake, delivered | 33.00 | 33.00 | 33.00 | 33.00 | 33.00 | 33.00 |
| Tin, Straits, New York | 91.125 | 91.125 | 91.375 | .... | 91.00 | 91.00 |
| Zinc, East St. Louis | 11.50 | 11.50 | 11.50 | 11.50 | 11.50 | 11.50 |
| Lead, St. Louis | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 |

Note: Quotations are going prices

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in February, based on quotations appearing in THE IRON AGE, were as follows:

| | | | |
|------------------------|--------|--------------------|-------|
| Electrolytic copper, | | Zinc, E. St. Louis | 11.50 |
| Del'd Conn. Valley | 33.00 | Zinc, New York | 12.00 |
| Lake copper, delivered | 33.00 | Lead, St. Louis | 14.80 |
| Straits tin, New York | 90.775 | Lead, New York | 15.00 |

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

| Alloy | Flat Sheet | | Plate |
|--------------|------------|-----------|-----------|
| | 0.032 in. | 0.081 in. | 0.136 in. |
| 1100, 3003 | 39.1 | 37.1 | 35.9 |
| 8004 | 44.0 | 39.8 | 38.1 |
| 5052 | 46.7 | 41.9 | 40.2 |
| 2024-O, -OAL | 49.4 | 40.8 | 39.3 |
| 7075-O, -OAL | 60.8 | 49.1 | 46.8 |

Extruded Solid Shapes: Shape factors 1 to 6, 35.7¢ to 86.7¢; 12 to 14, 39.4¢ to 61.0¢; 24 to 26, 42.2¢ to 81.3¢; 30 to 38, 49.8¢ to 91.9¢.

Red, Round: Rolled, 1.064-4.6 in., 1100-F, 48.6¢ to 40.1¢; cold finished, 0.375-3.400 in., 1100-F, 47.9¢ to 42.4¢.

Screw Machine Stock: Rounds, 2011-T3, 1/8-11/32 in., 63.5¢ to 50.1¢; 1/16 in., 49.9¢ to 46.9¢; 1 9/16-3 in., 45.7¢ to 42.7¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051-0.274 in., 1100, 47.1¢ to 35.5¢; 5052, 56.7¢ to 44.4¢; 2017-T4, 64.3¢ to 44.7¢; 6061-T4, 59.5¢ to 44.1¢.

Extruded Tubing: Rounds, 6063-T5, OD 1 1/4-2 in., 44.4¢ to 64.5¢; 2-4 in., 40.3¢ to 64.6¢; 4-6 in., 40.8¢ to 49.8¢; 6-9 in., 41.4¢ to 52.1¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42 1/2¢ x 60-in.; x 96-in., 48.80¢; x 120-in., 56.00¢; x 144-in., 57.20¢. Coiled sheet, per lb, 6.019 in. x 28 in., 30.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O 1/8 in., 56¢; 8/16 in., 67¢; 1/2 in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam 1/8 to 0.811 in., 77¢; 1/4 to 1 in., 68.5¢; 1/4 to 1.749 in., 86¢; 2 1/2 to 5 in., 81.5¢. Other alloys higher. Base up to 1/8 in. diam, 10,000 lb.; 1/8 to 2 in., 20,000 lb.; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.9¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD 1/8 to 5/16 in., 81.4¢; 5/16 to 1/2 in., 81.29¢; 1/2 to 1 in., 96¢; 1 to 2 in., 79¢; 0.163 to 0.219 in. wall; OD, 1/8 to 1/2 in., 64¢; 1 to 2 in., 66¢; 2 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1/8 in., 10,000 lb; 1/8 to 3 in., 20,000 lb; over 3 in., 30,000 lb. ASX-679.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$11; Bar, HR or forged, \$9; Forgings, \$9.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

"A" Nickel Monel Inconel

| Sheet, CR | 102 | 78 | 99 |
|--------------------|-----|-----|-----|
| Strip, CR | 102 | 87 | 126 |
| Rod, Bar, HR | 87 | 69 | 93 |
| Angles, HR | 87 | 69 | 93 |
| Plate, HR | 97 | 82 | 96 |
| Seamless Tube, 122 | 108 | 108 | 153 |
| Shot, Blocks | ... | 65 | |

Copper, Brass, Bronze

(Freight included on 500 lb)

| | Sheet | Rods | Shapes |
|---|-------|-------|--------|
| Copper | 49.79 | 48.11 | 51.86 |
| Copper, h-r | 51.76 | 48.11 | ... |
| Copper, drawn | 49.36 | | ... |
| Low brass | 47.35 | 47.29 | ... |
| Yellow brass | 44.27 | 44.21 | ... |
| Red brass | 45.44 | 45.38 | ... |
| Naval brass | 42.49 | 42.75 | ... |
| Leaded brass | 44.27 | 35.36 | 41.41 |
| Com. bronze | 50.02 | 50.02 | ... |
| Mang. bronze | 46.02 | 47.58 | ... |
| Phos. bronze | 70.12 | 70.62 | ... |
| Muntz metal | 42.15 | 43.40 | ... |
| Ni silver, 10 pct | 68.25 | 66.58 | ... |
| Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b. | | | |
| Strip | | | \$1.71 |
| Rod, bar, wire | | | 1.68 |

PRIMARY METALS

(Cents per lb, unless otherwise noted)

| | |
|--|------------------|
| Aluminum ingot, 99+%, 10,000 lb, freight allowed | 33.20 |
| Aluminum pig | 21.50 |
| Antimony, American, Laredo, Tex. | 28.50 |
| Beryllium copper, per lb conta'd Be | \$40.00 |
| Beryllium aluminum 5% Be, Dollars per lb contained Be | \$72.75 |
| Bismuth, ton lots | 32.25 |
| Cadmium, del'd | 81.70 |
| Cobalt, 97-99% (per lb) | \$2.60 to \$3.67 |
| Copper, electro, Conn. Valley | 33.00 |
| Copper, Lake, delivered | 33.00 |
| Gold, U. S. Treas., per troy oz. | \$35.00 |
| Indium, 99.3%, dollars per troy oz. | \$12.25 |
| Iridium, dollars per troy oz. | \$110 to \$120 |
| Lend, St. Louis | 14.80 |
| Lead, New York | 15.00 |
| Magnesium, 99+%, f.o.b. Freeport, Tex., 10,000 lb, pig | 27.00 |
| Magnesium, sticks, 100 to 500 lb, ingot | 46.00 to 48.00 |
| Mercury, dollars per 76-lb flask, f.o.b. New York | \$322 to \$324 |
| Nickel electro, f.o.b. N. Y. warehouse | 67.67 |
| Nickel oxide sinter, at Copper Cliff, Ont., contained nickel | 60.75 |
| Palladium, dollars per troy oz. | \$18 to \$20 |
| Platinum, dollars per troy oz. | \$78 to \$80 |
| Silver, New York, cents per troy oz. | 85.25 |
| Tin, New York | 91.00 |
| Titanium, sponge, grade A-1 | \$4.50 |
| Zinc, East St. Louis | 11.50 |
| Zinc, New York | 12.00 |
| Zirconium copper, 50 pct | \$6.20 |

REMETELED METALS**Brass Ingot**

(Cents per lb delivered, carloads)

| | |
|----------------|-------|
| 85-5-5-5 ingot | |
| No. 115 | 32.00 |
| No. 120 | 32.50 |
| No. 123 | 32.00 |
| 80-10-10 ingot | |
| No. 305 | 37.00 |
| No. 315 | 34.75 |
| 85-10-2 ingot | |
| No. 210 | 45.75 |
| No. 215 | 42.25 |
| No. 245 | 37.75 |
| Yellow ingot | |
| No. 405 | 28.75 |
| No. 421 | 30.75 |

Aluminum Ingot

| | |
|---|-------------|
| (Cents per lb del'd 30,000 lb and over) | |
| 95-5 aluminum-silicon alloys | |
| 0.30 copper, max. | 30.00-32.00 |
| 0.60 copper, max. | 29.75-31.75 |
| Piston alloys (No. 122 type) | 29.00-31.50 |
| No. 12 alum. (No. 3 grade) | 28.00-30.00 |
| 108 alloy | 28.50-30.50 |
| 195 alloy | 29.00-32.50 |
| 13 alloy (0.60 copper max.) | 29.75-31.00 |
| ASX-679 | 29.00-31.00 |

Steel deoxidizing aluminum, notch-bar granulated or shot

| | |
|--------------------|-------------|
| Grade 1-95-97 1/2% | 29.50-32.50 |
| Grade 2-92-95% | 28.50-31.50 |
| Grade 3-90-92% | 27.50-30.50 |
| Grade 4-85-90% | 27.00-29.50 |

ELECTROPLATING SUPPLIES**Anodes**

(Cents per lb, freight allowed, 5000 lb lots)

| | |
|--|--------|
| Copper | |
| Cast, oval, 15 in. or longer | 44.82 |
| Electrodeposited | 39.78 |
| Flat rolled | 45.42 |
| Brass, 80-20 | |
| Cast, oval, 15 in. or longer | 43.515 |
| Zinc, flat cast | 20.25 |
| Ball, anodes | 18.50 |
| Nickel, 99 pct plus | |
| Cast | 91.70 |
| Cadmium | \$1.70 |
| Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn. | 94.1% |

Chemicals

| | |
|---|--------|
| (Cents per lb, f.o.b. shipping points) | |
| Copper cyanide, 100 lb drum | 63.00 |
| Copper sulphate, 99.5% crystals, bbl. | 12.85 |
| Nickel salts, single or double, 4-100 lb bags, f.r.t. allowed | 31.25* |
| Nickel chloride, 300 to 400 lb | 43.50* |
| Silver cyanide, 100 lb. lots, per oz. | 75% |
| Sodium cyanide, 96 pct domestic | |
| 200 lb drums | 19.25 |
| Zinc cyanide, 100 lb drum | \$4.80 |

*Effective Jan. 3.

SCRAP METALS**Brass Mill Scrap**

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

| | |
|-----------------------|--------|
| Heavy Turnings | |
| Copper | 29 |
| Yellow brass | 21 1/2 |
| Red brass | 25 1/2 |
| Comm. bronze | 26 1/2 |
| Mang. bronze | 20 1/2 |
| Yellow brass rod ends | 21 1/2 |

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

| | |
|----------------------|--------|
| No. 1 copper wire | 33 1/2 |
| No. 3 copper wire | 32 |
| Light copper | 30 1/2 |
| No. 1 composition | 25 1/2 |
| No. 1 comp. turnings | 20 |
| Rolled brass | 20 |
| Brass pipe | 20 1/2 |
| Radiators | 21 |

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

| | |
|-----------------------------|---------------|
| Aluminum | |
| No. 1 heavy copper and wire | 29 1/2-30 |
| No. 2 heavy copper and wire | 28 |
| Light copper | 26 |
| New type shell cuttings | 26-26 1/2 |
| Auto radiators (unsweated) | 18 1/2-19 |
| No. 1 composition | 23 |
| No. 1 composition turnings | 22 1/2-23 1/2 |
| Unlined red car boxes | 18 1/2-19 |
| Cocks and faucets | 19 1/2-20 |
| Mixed heavy yellow brass | 16 1/2-17 |
| Old rolled brass | 16-18 1/2 |
| Brass pipe | 16 1/2-17 |
| New soft brass clippings | 19 |
| Brass rod ends | 19 |
| No. 1 brass rod turnings | 18 |

Zinc

(New zinc clippings

| | |
|--------------------|-------|
| Old zinc | 3 1/2 |
| Zinc routings | 3 1/2 |
| Old die cast scrap | 3 1/2 |

Nickel and Monel

(Pure nickel clippings

| | |
|--------------------------------|----|
| Clean nickel turnings | 40 |
| Nickel rod ends | 57 |
| New Monel clippings | 25 |
| Clean Monel turnings | 20 |
| Old sheet Monel | 23 |
| Nickel silver clippings, mixed | 16 |
| Nickel silver turnings, mixed | 14 |

Lead

(Soft scrap lead

| | |
|----------------------|-------|
| Battery plates (dry) | 6 |
| Batteries, acid free | 4 1/2 |

Magnesium

(Segregated solids

| | |
|---------------|-----------|
| Castings | 17 1/2-18 |
| Miscellaneous | |

Miscellaneous

(Block tin

| | |
|-------------------------|---------------|
| No. 1 pewter | 50 |
| No. 1 auto babbitt | 45 |
| Mixed common babbitt | 12 |
| Solder joints | 17 |
| Siphon tops | 45 |
| Small foundry type | 16 1/2-18 1/2 |
| Monotype | 18 |
| Lino. and stereotype | 14 1/2-14 1/2 |
| Electrotype | 12 1/2-12 1/2 |
| Hand picked type shells | 16 1/2-16 1/2 |
| Lino. and stereo. dress | 16 1/2 |
| Electro dress | 8 |

| IRON AGE STEEL PRICES <i>(Effective Mar. 3, 1955)</i> | Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply. | | | | | | | | | | | | | |
|--|---|------------------------------|-----------------------|-----------------------|-----------------------|--------------------|-------------------------|---------------------------|---------------------|----------------------------|------------------------------|------------------------------|-------------------------|--------------------------|
| | BILLETS, BLOOMS, SLABS | | | PIL- ING | SHAPES STRUCTURALS | | | STRIP | | | | | | |
| | Carbon Rolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | | Sheet Steel | Carbon | Hi Str. Low Alloy | Carbon Wide- Flange | Hot- rolled | Cold- rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot- rolled | Alloy Cold- rolled |
| EAST | Bethlehem, Pa. | | | | | 4.30 B3 | 6.45 B3 | 4.30 B3 | | | | | | |
| | Buffalo, N. Y. | \$64.00 B3 | \$75.00 B3, R3 | \$86.00 B3, R3 | 5.875 B3 | 4.30 B3 | 6.45 B3 | 4.30 B3 | 4.05 B3, R3 | 5.75 B3, R3 | 6.15 B3 | 8.425 B3 | | |
| | Clayton, Del. | | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | | |
| | Conshohocken, Pa. | | | | | | | | | | | | | |
| | New Bedford, Mass. | | | | | | | | | | | | | |
| | Johnstown, Pa. | \$64.00 B3 | \$75.00 B3 | \$86.00 B3 | | 4.30 B3 | 6.45 B3 | | 4.05 B3 | | | | | |
| | Fairless, Pa. | | | | | | | | | | | | | |
| | New Haven, Conn. | | | | | | | | | | 6.20 D1 6.50 A5 | | | |
| | Phoenixville, Pa. | | | | | 3.95 P2 | | 4.30 P2 | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | 4.05 B3 | 5.75 B3 | 6.15 B3 | 8.425 B3 | | |
| | Bridgeport, Wallingford, Conn. | \$60.00 N8 | \$83.00 N8 | | | | | | 4.35 N8 | 6.20 W1 | | | 7.80 N8 | |
| | Providence, R. I. Worcester, Mass. | | | | | | | | | 6.30 N7 6.60 A5 | | | | 12.75 A5 12.80 N7 |
| MIDDLE WEST | Alton, Ill. | | | | | | | | 4.225 L1 | | | | | |
| | Ashland, Ky. | | | | | | | | 4.05 A7 | | | | | |
| | Canton-Massillon, Deer, Ohio | | \$80.00 R3 | \$86.00 R3, T3 | | | | | | | | | | 12.45 G4 |
| | Chicago, Ill. | \$64.00 U1 | \$75.00 R3, U1, W8 | \$86.00 U1, W8, R3 | 5.875 U1 | 4.25 U1, W8 | 6.40 U1, Y1 | 4.25 U1 | 4.05 A1, N4 W8 | 5.85 A1 | | | | |
| | Cleveland, Ohio | | | | | | | | | 5.75 A5, J3 | | 6.00 A5 | | 12.45 A5 |
| | Detroit, Mich. | | | \$86.00 R5 | | | | | 4.15 G3, M2 | 5.85 D1, D2, G3, M2, P1 | 6.25 G3 | 8.70 D2, G3 | | |
| | Duluth, Minn. | | | | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | \$64.00 U1 | \$75.00 U1 | \$86.00 U1, Y1 | 5.875 J3 | 4.25 J3, U1 | 6.40 U1, J3 | | 6.05 J3, U1, Y1 | 5.85 J3 | 6.15 U1, J3, Y1 | 8.80 Y1 | 8.70 U1, Y1 | |
| | Sterling, Ill. | | | | | | | | 4.15 N4 | | | | | |
| | Indianapolis, Ind. | | | | | | | | | 5.80 C5 | | | | |
| | Newport, Ky. | | | | | | | | | | | | 6.70 Y5 | |
| | Middletown, Ohio | | | | | | | | | 5.75 A7 | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | | | | | | | | 4.05 S1, R3 | 5.75 S1, R3, T4 | 6.15 S1, R3 | 8.80 S1, R3 | 8.70 S1 | 12.45 S1 |
| WEST | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | \$64.00 U1, J3 | \$75.00 R3, U1, C1 | \$86.00 U1, C11 | 5.875 U1 | 4.25 J3, U1 | 6.40 J3, U1 | 4.25 U1 | 4.05 P6 | 5.75 B1, J3 | | | 6.70 S9 | 12.45 S9 |
| | Portsmouth, Ohio | | | | | | | | 4.05 P7 | 5.75 P7 | | | | |
| | Wheeling, W. Va. | | | | | 4.25 W3 | | | 6.05 W3 | 5.75 F3, W3 | 6.15 W3 | 8.80 W3 | | |
| | Youngstown, Ohio | | \$75.00 C10 | \$86.00 Y1, C10 | | 4.25 Y1 | 6.40 Y1 | | 4.05 U1, Y1 | 5.75 Y1, C5 | 6.15 U1, Y1 | 8.80 Y1 | 8.70 U1, Y1 | 12.45 C5 |
| | Fresno, Cal. | \$72.00 K1 | \$86.00 K1 | \$105.00 K1 | | 4.90 K1 | 7.05 K1 | 5.25 K1 | 4.825 K1 | 7.05 K1 | 7.25 K1 | | 8.10 K1 | 14.85 K1 |
| | Genoa, Utah | | \$78.00 C7 | | | 4.25 C7 | 6.40 C7 | | | | | | | |
| | Kansas City, Mo. | | | | | 4.30 S2 | 6.45 S2 | | | | 6.40 S2 | | 6.95 S2 | |
| | Los Angeles, Torrance, Cal. | | \$87.50 B2 | \$106.00 B2 | | 4.95 B2, C7 | 7.10 B2 | | 4.80 B2, C7 | 7.00 C7 | | | | |
| | Minneapolis, Calif. | | | | | 4.70 C6 | | | 5.15 C6 | | | | | |
| | Portland, Ore. | | | | | 5.00 O2 | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | \$87.50 B2 | | | 4.95 B2 | 7.05 B2 | | 4.80 B2, C7 | | | | | |
| | Seattle, Wash. | | \$91.50 B2 | | | 5.00 B2 | 7.15 B2 | | 5.95 B2, P12 | | | | | |
| | Atlanta, Ga. | | | | | | | | 4.25 A8 | | | | | |
| | Fairfield, Ala. City, Birmingham, Ala. | \$64.00 T2 | \$75.00 T2 | | | 4.25 C6, R3, T2 | 6.40 T2 | | 6.05 R3, T2, C16 | | 6.15 T2 | | | |
| | Houston, Tex. | | \$83.00 S2 | \$91.00 S2 | | 4.30 S2 | 6.45 S2 | | | | 6.40 S2 | 6.85 S2 | | |

| IRON AGE STEEL PRICES (Effective Mar. 1, 1955) | | Prices identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply. | | | | | | | | WIRE ROD | TINPLATE† | BLACK PLATE |
|--|------------------------|--|--------------------------|-----------------------|------------------------------|------------------------------|-------------------------------|--------------------------|--------------------------------|----------------------------------|-----------------------------------|----------------|
| | | SHEETS | | | | | | | | | | |
| Hot-rolled 18 ga. & heavier | Cold- rolled | Galvanized 16 ga. | Enamel- ing 12 ga. | Long Tin 16 ga. | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | Hot- rolled 19 ga. | Cokes* 1.25-lb. base box | Electro* 0.25-lb. base box | Hollowware Enameling 29 ga. | |
| Bethlehem, Pa. | | | | | | | | | | | | |
| Buffalo, N. Y. | 4.85 B3 | 4.95 B3 | | | 6.10 B3 | 7.50 B3 | | | 4.875 W6 | | | |
| Claymont, Del. | | | | | | | | | | | | |
| Coatesville, Pa. | | | | | | | | | | | | |
| Conshohocken, Pa. | 4.10 A2 | 5.00 A2 | | | 6.15 A2 | | | | | | | |
| Harrisburg, Pa. | | | | | | | | | | | | |
| Hartford, Conn. | | | | | | | | | | | | |
| Johnstown, Pa. | | | | | | | | | 4.875 B3 | | | |
| Fairless, Pa. | 4.10 U1 | 5.00 U1 | | | 6.15 U1 | 7.55 U1 | | | | \$3.90 U1 | \$7.80 U1 | |
| New Haven, Conn. | | | | | | | | | | | | |
| Phoenixville, Pa. | | | | | | | | | | | | |
| Sparrows Pt., Md. | 4.85 B3 | 4.95 B3 | 5.45 B3 | | 6.10 B3 | 7.50 B3 | 8.20 B3 | | 4.775 B3 | \$8.90 B3 | \$7.80 B3 | |
| Worcester, Mass. | | | | | | | | | 4.875 A5 | | | |
| Trenton, N. J. | | | | | | | | | | | | |
| Alton, Ill. | | | | | | | | | 4.85 L1 | | | |
| Ashland, Ky. | 4.85 A7 | | 5.45 A7 | 5.375 A7 | | | | | | | | |
| Canton-Massillon, Dover, Ohio | | | 5.45 R1, R3 | | | | | | 5.175 R1 | | | |
| Chicago, Joliet, Ill. | 4.85 A1, W8 | | | | 6.10 U1 | | | | 4.875 A5, N4, R3 | | | |
| Sterling, Ill. | | | | | | | | | 4.775 N4 | | | |
| Cleveland, Ohio | 4.85 J3, R3 | 4.95 J3, R3 | | 5.375 R3 | 6.10 J3, R3 | 7.50 J3, R3 | | | 4.875 A5 | | | |
| Detroit, Mich. | 4.15 G3, M2 | 5.05 G3 | | | 6.20 G3 | 7.80 G3 | | | | | | |
| Newport, Ky. | 4.85 N5 | 4.95 N5 | 5.45 N5 | | | | | | | | | |
| Gary, Ind. Harbor, Indiana | 4.85 J3, U1, Y1 | 4.95 J3, U1, Y1 | 5.45 U1, J3 | 5.375 J3, U1 | 5.85 U1 | 6.10 U1, J3, Y1 | 7.50 U1, Y1 | | 4.875 Y1 | \$8.90 J3, U1, Y1 | \$7.50 J3, U1, Y1 | 6.20 U1, Y1 |
| Granite City, Ill. | 4.25 G2 | 5.15 G2 | 5.45 G2 | 5.575 G2 | | | | | | | \$7.80 G2 | 6.30 G2 |
| Kokomo, Ind. | 4.15 C9 | | 5.55 C9 | | | | | | 5.20 C9 | 4.775 C9 | | |
| Manfield, Ohio | | | | | 5.85 E2 | | | | 5.175 E2 | | | |
| Middletown, Ohio | | 4.95 A7 | | 5.375 A7 | 5.85 A7 | | | | | | | |
| Niles, Ohio Sharon, Pa. | 4.85 S1, R3 S.30 N3 | 4.95 R3 5.975 N3 | 5.45 N3 | 6.725 N3 | 5.85 N3 | 6.10 S1, R3 | 7.50 R3 | | | \$8.80 R3 | \$7.50 R3 | |
| Pittsburgh, Pa. Midland, Pa. Butler, Pa. | 4.85 J3, U1, P6 | 4.95 J3, U1, P6 | 5.45 U1 | 5.375 U1 | | 6.10 J3, U1 | 7.50 J3, U1 | 8.20 U1 | 4.875 A5 4.875 P6 | \$8.90 J3, U1 | \$7.50 J3, U1 | 6.20 U1 |
| Portsmouth, Ohio | 4.85 P7 | 4.95 P7 | | | | | | | 4.875 P7 | | | |
| Wairton, Wheeling, Follansbee, W. Va. | 4.85 W3, W5 | 4.95 W3, W5, P3 | 5.45 W3, W5 | | 5.85 W3, W5 | 6.10 W3 | 7.50 W3 | | | \$8.80 W3, W5 | \$7.50 W3, W5 | 6.20 F3, W5 |
| Youngstown, Ohio | 4.85 U1, Y1 | 4.95 Y1 | | 5.375 Y1 | | 6.10 U1, Y1 | 7.50 Y1 | | 4.875 Y1 | | | |
| Fontana, Cal. | 4.825 K1 | 4.85 K1 | | | | 6.875 K1 | 8.55 K1 | | | 5.475 K1 | | |
| Geneva, Utah | 4.15 C7 | | | | | | | | | | | |
| Kansas City, Mo. | | | | | | | | | | 4.925 S2 | | |
| Los Angeles, Torrance, Cal. | | | | | | | | | | 5.475 C7, B2 | | |
| Minneapolis, Colo. | | | | | | | | | | 4.925 C6 | | |
| San Francisco, Niles, Pittsburg, Cal. | 4.75 C7 | 5.90 C7 | 6.20 C7 | | | | | | 5.325 C7 | \$9.55 C7 | \$8.25 C7 | |
| Seattle, Wash. | | | | | | | | | | | | |
| Atlanta, Ga. | | | | | | | | | | | | |
| Fairfield, Ala. Alabama City, Ala. | 4.85 R3, T2 | 4.95 T2 | 5.45 R3, T2 | | 6.10 T2 | | | | 5.35 R3 | 4.875 T2, R3 | \$8.90 T2 | \$7.80 T2 |
| Houston, Texas | | | | | | | | | | 4.925 S2 | | |

**STEEL
PRICES**
(Effective
Mar. 1, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | BARS | | | | | | PLATES | | | WIRE |
|-------------|--|------------------------|-----------------------|-------------------------------------|----------------------|--------------------------------|--------------------------|---------------------|----------|----------------------|
| | Carbon Steel | Reinforcing | Cold Finished | Alloy Hot-rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | |
| EAST | Bethlehem, Pa. | | | | 5.975 R3 | 6.625 R3 | 6.45 R3 | | | |
| | Buffalo, N. Y. | 4.30 B3,R3 | 4.30 B3,R3 | 5.45 B3 | 5.975 B3,R3 | 6.625 B3,B5 | 6.45 R3 | 4.225 B3,R3 | | 6.45 B3 |
| | Claymont, Del. | | | | | | | 4.225 C4 | | |
| | Coolessville, Pa. | | | | | | | 4.225 L4 | | |
| | Conshohocken, Pa. | | | | | | | 4.225 A2 | | 6.45 A2 |
| | Harrietta, Pa. | | | | | | 3.975 C3 | 5.275 C3 | | |
| | Hartford, Conn. | | 5.90 R3 | | 6.925 R3 | | | | | |
| | Johnstown, Pa. | 4.30 B3 | 4.30 B3 | | 5.975 B3 | | 6.45 R3 | 4.225 B3 | | 6.45 B3 |
| | Fairless, Pa. | 4.45 U1 | 4.45 U1 | | 5.225 U1 | | | | | |
| | Nowark, N. J. | | | 5.95 W10 | | 6.90 W10 | | | | |
| | Camden, N. J. | | | 5.95 P10 | | | | | | |
| | Bridgeport, Putnam, Conn. | 6.55 NB | | 5.95 W10 | 5.225 NB | | 4.475 NB | | | |
| | Sparrows Pt., Md. | | 4.30 B3 | | | | 4.225 B3 | | 5.90 B3 | 6.45 B3 |
| | Palmer, Worcester, Readville, Mansfield, Mass. | | | 5.95 W11 5.95 B3,C14 | | 6.925 A5,B5 | | | | 6.85 A5, W6 |
| | Alton, Ill. | 4.50 L1 | | | | | | | | 5.925 L1 |
| | Ashland, Newport, Ky. | | | | | | 4.225 A7,N5 | | 5.90 N5 | |
| | Canton-Massillon, Mansfield, Ohio | 4.40 R3 | | 5.40 R3,R3 | 5.975 R3,T3 | 6.625 R3,R3, T3 | 4.225 E2 | | | |
| MIDDLE WEST | Chicago, Joliet, Ill. | 4.30 U1, N4,W8,R5 | 4.30 N4,R3 | 5.40 A5,W10, W8,B3,L2 | 5.975 U1,R3, W8 | 6.625 A5,W8, W10,L2,B3 | 4.225 U1,W8, J3,A1,R3 | 5.275 U1 | 5.90 U1 | 6.75 A5, R3,N4,W7 |
| | Cleveland, Ohio | 4.30 R3 | 4.30 R3 | 5.40 A5,C13 | | 6.625 A5,C13 | 6.45 R3 | 4.225 J3,R3 | 5.275 J3 | 6.45 J3,R3 |
| | Detroit, Mich. | 4.40 G3 4.45 R3 | | 5.40 R3 5.90 B3,P8 5.95 P3 | 5.975 R3 5.175 G3 | 6.625 R3 6.825 B3,P3, P8 | 6.55 G3 | 4.325 G3 | | 6.55 G3 |
| | Duluth, Minn. | | | | | | | | | 5.75 A5 |
| | Gary, Ind. Harbor, Crawfordville | 4.30 I3, U1, Y1 | 4.30 I3, U1, Y1 | 5.40 M5,R3 | 5.975 I3, U1, Y1 | 6.625 M5, R3 | 6.45 U1,I3, Y1 | 4.225 I3, U1,Y1 | 5.275 I3 | 5.90 U1,Y1 |
| | Grain City, Ill. | | | | | | | 4.425 G2 | | |
| | Kokomo, Ind. | | | | | | | | | 5.85 C9 |
| | Sterling, Ill. | 4.40 N4 | 4.40 N4 | | | | | | | 5.85 N4 |
| | Niles, Ohio Sharon, Pa. | 4.30 R3 | | | | | 6.45 R3 | 4.225 S1,R3 | | 5.90 S1 |
| | Pittsburgh, Pa. Midland, Pa. | 4.30 J3, U1, C11 | 4.30 J3, U1 | 5.40 A5,C8, C11,J3, W10,B4,R3 | 5.975 U1,C11 | 6.625 A5,C11, W10,C8,R3 | 6.45 J3, U1 | 4.225 J3, U1 | 5.275 U1 | 5.90 U1 |
| | Portsmouth, Ohio | | | | | | | | | 5.75 P7 |
| | Worthington, Wheeling, Fallsburg, W. Va. | 4.30 W3 | | | | | | 4.225 W3, W5 | | |
| | Youngstown, Ohio | 4.30 U1, Y1, C10,R3 | 4.30 U1, Y1, R3 | 5.40 F2, Y1, C10 | 5.975 U1, Y1, C10 | 6.625 Y1,C10 6.865 F2 | 6.45 U1, Y1 | 4.225 U1, Y1, R3 | | 5.90 Y1 |
| | Emeryville, Calif. | 5.95 J5 | 5.95 J5 | | | | | | | |
| | Fontana, Calif. | 5.90 K1 | 5.90 K1 | | 6.125 K1 | | 7.70 K1 | 4.875 K1 | | 6.45 K1 |
| | Geneva, Utah | | | | | | | 4.225 C7 | | 6.45 C7 |
| | Kansas City, Mo. | 4.55 S2 | 4.55 S2 | | 5.335 S2 | | 6.70 S2 | | | 6.90 S2 |
| | Los Angeles, Torrance, Calif. | 5.90 B2,C7 | 5.90 B2,C7 | 6.85 R3 | 6.125 B2 | | 7.15 B2 | | | 6.70 B2 |
| | Minnequa, Colo. | 4.75 C6 | 4.75 C6 | | | | | 5.875 C6 | | 6.80 C6 |
| | Portland, Ore. | 5.95 O2 | 5.95 O2 | | | | | | | |
| | San Francisco, Niles, Pittsburgh, Cal. | 5.90 C7,P9 5.95 B2 | 5.90 C7,P9 5.95 B2 | | | | 7.30 B2 | | | 6.70 C7 |
| | Seattle, Wash. | 5.95 B2,P12, N6 | 5.95 B2,P12 | | | | 7.30 B2 | 5.125 B2 | | 6.70 B2 |
| SOUTH | Atlanta, Ga. | 4.50 A8 | 4.50 A8 | | | | | | | 5.95 A8 |
| | Fairfield, Ala. City, Birmingham, Ala. | 4.30 T2,C16, R3 | 4.30 T2,C16, R3 | | | | 6.45 T2 | 4.225 T2,R3 | | 6.45 T2 |
| | Houston, Ft. Worth, Lone Star, Tex. | 4.55 S2 | 4.55 S2 | | 5.325 S2 | | 6.70 S2 | 4.35 L3 4.275 S2 | | 5.95 S2 |
| | | | | | | | | 5.95 S2 | 6.50 S2 | 6.80 S2 |

Steel Prices (Effective Mar. 1, 1955)

Key to Steel Producers

With Principal Offices

| | |
|-----|--|
| A1 | Acme Steel Co., Chicago |
| A2 | Alan Wood Steel Co., Conshohocken, Pa. |
| A3 | Allegheny Ludlum Steel Corp., Pittsburgh |
| A4 | American Castmets Co., Carnegie, Pa. |
| A5 | American Steel & Wire Div., Cleveland |
| A6 | Angell Nail & Chapin Co., Cleveland |
| A7 | Armen Steel Corp., Middletown, O. |
| A8 | Atlantic Steel Co., Atlanta, Ga. |
| B1 | Babcock & Wilcox Tube Div., Beaver Falls, Pa. |
| B2 | Bethlehem Pacific Coast Steel Corp., San Francisco |
| B3 | Bethlehem Steel Co., Bethlehem, Pa. |
| B4 | Blair Strip Steel Co., New Castle, Pa. |
| B5 | Bliss & Laughlin, Inc., Harvey, Ill. |
| C1 | Calstrip Steel Corp., Los Angeles |
| C2 | Carpenter Steel Co., Reading, Pa. |
| C3 | Central Iron & Steel Co., Harrisburg, Pa. |
| C4 | Claymont Products Dept., Claymont, Del. |
| C5 | Cold Metal Products Co., Youngstown, O. |
| C6 | Colorado Fuel & Iron Corp., Denver |
| C7 | Columbia Geneva Steel Div., San Francisco |
| C8 | Columbia Steel & Shading Co., Pittsburgh |
| C9 | Continental Steel Corp., Kokomo, Ind. |
| C10 | Copperweld Steel Co., Pittsburgh, Pa. |
| C11 | Crucible Steel Co. of America, New York |
| C12 | Cumberland Steel Co., Cumberland, Md. |
| C13 | Cuyahoga Steel & Wire Co., Cleveland |
| C14 | Compressed Steel Shafting Co., Readville, Mass. |
| C15 | G. O. Carlson, Inc., Thorndale, Pa. |
| C16 | Connors Steel Div., Birmingham |
| D1 | Detroit Steel Corp., Detroit |
| D2 | Detroit Tube & Steel Div., Detroit |
| D3 | Driver Harris Co., Harrison, N. J. |
| D4 | Dickson Weatherproof Nail Co., Evanston, Ill. |
| D5 | Henry Distinct & Sons, Inc., Philadelphia |
| E1 | Eastern Stainless Steel Corp., Baltimore |
| E2 | Empire Steel Co., Mansfield, O. |
| F1 | Firth Sterling, Inc., McKeesport, Pa. |
| F2 | Fitzsimmons Steel Corp., Youngstown |
| F3 | Follansbee Steel Corp., Follansbee, W. Va. |
| G1 | Globe Iron Co., Jackson, O. |

| | |
|-----|---|
| G2 | Granite City Steel Co., Granite City, Ill. |
| G3 | Great Lakes Steel Corp., Detroit |
| G4 | Greer Steel Co., Dover, O. |
| H1 | Hanna Furnace Corp., Detroit |
| H2 | Ingersoll Steel Div., Chicago |
| H3 | Inland Steel Co., Chicago |
| H4 | Interlake Iron Corp., Cleveland |
| J1 | Jackson Iron & Steel Co., Jackson, O. |
| J2 | Jesup Steel Corp., Washington, Pa. |
| J3 | Jones & Laughlin Steel Corp., Pittsburgh |
| J4 | Judy Mig. & Supply Co., Chicago |
| J5 | Judson Steel Corp., Emeryville, Calif. |
| K1 | Kaiser Steel Corp., Fontana, Cal. |
| K2 | Keystone Steel & Wire Co., Pocono |
| K3 | Koppers Co., Granite City, Ill. |
| L1 | Laclede Steel Co., St. Louis |
| L2 | La Salle Steel Co., Chicago |
| L3 | Lone Star Steel Co., Dallas |
| L4 | Lukens Steel Co., Coatesville, Pa. |
| M1 | Mahoning Valley Steel Co., Niles, O. |
| M2 | McLouth Steel Corp., Detroit |
| M3 | Mercer Tube & Mig. Co., Sharon, Pa. |
| M4 | Mid-States Steel & Wire Co., Crawfordsville, Ind. |
| M5 | Monarch Steel Div., Hammond, Ind. |
| M6 | Mystic Iron Works, Everett, Mass. |
| M8 | National Supply Co., Pittsburgh |
| N2 | National Tube Div., Pittsburgh |
| N3 | Niles Rolling Mill Div., Niles, O. |
| N4 | Northwestern Steel & Wire Co., Sterling, Ill. |
| N5 | Newport Steel Corp., Newport, Ky. |
| N6 | Northwest Steel Rolling Mills, Seattle |
| N7 | Newman Crosby Steel Co., Pawtucket, R. I. |
| N8 | Northeastern Steel Corp., Bridgeport, Conn. |
| O1 | Oliver Iron & Steel Co., Pittsburgh |
| O2 | Oregon Steel Mills, Portland |
| P1 | Page Steel & Wire Div., Monaca, Pa. |
| P2 | Phoenix Iron & Steel Co., Philadelphia, Pa. |
| P3 | Pilgrim Drawn Steel Div., Plymouth, Mich. |
| P4 | Pittsburgh Coke & Chemical Co., Pittsburgh |
| P5 | Pittsburgh Screw & Bolt Co., Pittsburgh |
| P6 | Pittsburgh Steel Co., Pittsburgh |
| P7 | Portsmouth Div., Detroit Steel Corp., Detroit |
| P8 | Plymouth Steel Co., Detroit |
| P9 | Pacific States Steel Co., Niles, Cal. |
| P10 | Precision Drawn Steel Co., Camden, N. J. |
| P11 | Production Steel Strip Corp., Detroit |
| P12 | Pacific Steel Rolling Mills, Seattle |
| R1 | Reeves Steel & Mig. Co., Dover, O. |
| R2 | Reliance Div., Eason Mig. Co., Massillon, O. |
| R3 | Republic Steel Corp., Cleveland |
| R4 | Roebing Sons Co., John A., Trenton, N. J. |
| R5 | Rotary Electric Steel Co., Detroit |
| R6 | Rodney Metals, Inc., New Bedford, Mass. |
| R7 | Rome Strip Steel Co., Rome, N. Y. |
| S1 | Sharon Steel Corp., Sharon, Pa. |
| S2 | Sheffield Steel Corp., Kansas City |
| S3 | Shenango Furnace Co., Pittsburgh |
| S4 | Simonds Saw & Steel Co., Fitchburg, Mass. |
| S5 | Swett's Steel Co., Williamsport, Pa. |
| S6 | Standard Forging Corp., Chicago |
| S8 | Superior Drawn Steel Co., Monaca, Pa. |
| S9 | Superior Steel Corp., Carnegie, Pa. |
| T1 | Tonawanda Iron Div., N. Tonawanda, N. Y. |
| T2 | Tennessee Coal & Iron Div., Fairfield |
| T3 | Tennessee Products & Chem. Corp., Nashville |
| T4 | Thomas Strip Div., Warren, O. |
| T5 | Timken Steel & Tube Div., Canton, O. |
| T6 | Tremont Nail Co., Wardsburg, Mass. |
| T7 | Texas Steel Co., Fort Worth |
| U1 | United States Steel Corp., Pittsburgh |
| U2 | Universal-Cyclops Steel Corp., Bridgeville, Pa. |
| U3 | Ulrich Stainless Steel, Wallingford, Conn. |
| U4 | U. S. Pipe & Foundry Co., Birmingham |
| W1 | Wallingford Steel Co., Wallingford, Conn. |
| W2 | Washington Steel Corp., Washington, Pa. |
| W3 | Weirton Steel Co., Weirton, W. Va. |
| W4 | Wheeland Tube Co., Wheeland, Pa. |
| W5 | Wheeling Steel Corp., Wheeling, W. Va. |
| W6 | Wickwire Spangler Steel Div., Buffalo |
| W7 | Wilson Steel & Wires Co., Chicago |
| W8 | Wisconsin Steel Co., S. Chicago, Ill. |
| W9 | Woodward Iron Co., Woodward, Ala. |
| W10 | Wyckoff Steel Co., Pittsburgh |
| W11 | Worcester Pressed Steel Co., Worcester, Mass. |
| Y1 | Youngstown Sheet & Tube Co., Youngstown |

PIPE AND TUBING

Base discounts (per) f.o.b. mills. Base price about \$200 per net ton.

| | BUTTWELD | | | | | | | | | | SEAMLESS | | | | | | | | | |
|--------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| STANDARD T. & C. | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. B3 | 21.75 | 6.5 | 24.75 | 10.5 | 27.25 | 14.0 | 29.75 | 14.75 | 30.25 | 15.75 | 30.75 | 16.25 | 32.25 | 16.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown B3 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana K1 | 19.75 | W4.5 | 13.75 | W6.5 | 16.25 | 3.0 | 16.75 | 3.75 | 19.25 | 4.75 | 19.75 | 5.25 | 21.25 | 5.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh J3 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Alton, Ill. L1 | 21.75 | 6.5 | 24.75 | 10.5 | 27.25 | 14.0 | 29.75 | 14.75 | 30.25 | 15.75 | 30.75 | 16.25 | 32.25 | 16.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon M3 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Fairless N2 | 21.75 | 6.5 | 24.75 | 10.5 | 27.25 | 14.0 | 29.75 | 14.75 | 30.25 | 15.75 | 30.75 | 16.25 | 32.25 | 16.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh N1 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheeling W5 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheeling W4 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown Y1 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Indiana Harbor Y1 | 22.75 | 7.5 | 25.75 | 15.5 | 28.25 | 19.0 | 30.75 | 19.75 | 31.25 | 20.75 | 31.75 | 21.25 | 33.25 | 21.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Lorraine N2 | 23.75 | 6.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| EXTRA STRONG PLAIN ENDS | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. B3 | 25.25 | 11.5 | 29.25 | 15.5 | 31.25 | 19.0 | 31.75 | 17.75 | 32.25 | 18.75 | 32.75 | 19.25 | 33.25 | 19.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown B3 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Fairless N2 | 25.25 | 11.5 | 29.25 | 15.5 | 31.25 | 19.0 | 31.75 | 17.75 | 32.25 | 18.75 | 32.75 | 19.25 | 33.25 | 19.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana K1 | 14.25 | ..... | 18.25 | ..... | 20.25 | ..... | 20.75 | ..... | 21.25 | ..... | 21.75 | ..... | 22.25 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh J3 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |
| Alton, Ill. L1 | 25.25 | 11.5 | 29.25 | 15.5 | 31.25 | 19.0 | 31.75 | 17.75 | 32.25 | 18.75 | 32.75 | 19.25 | 33.25 | 19.0 | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon M3 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |
| Pittsburgh N1 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |
| Wheeling W5 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |
| Wheeling W4 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |
| Youngstown Y1 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |
| Indiana Harbor Y1 | 26.25 | 12.5 | 29.25 | 16.5 | 32.25 | 20.0 | 32.75 | 18.75 | 33.25 | 19.75 | 33.75 | 20.75 | 34.25 | 19.0 | 16.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |
| Lorraine N2 | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | 19.0 | 3.25 | 21.5 | 5.75 | 38.5 |

Threads only, butt-weld and seamless 2 1/4 pt. higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 6 1/2 pt. higher discount. Butt-weld jobbers discount, 8 pt. Galvanized discounts based on size price range of over \$6 to 116 lb. per lb., East St. Louis. For each 2¢ change in size, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 3 pt.; 2 1/2 and 3-in., 1 pt. e.g., size price range of over \$6 to 116 would lower discounts; size price in range of over \$6 to 96 would increase discounts. East St. Louis size price new 11.80¢ per lb.

Steel Prices

(Effective Mar. 1, 1964)

To identify producers, see Key on preceding page.

ELECTRICAL SHEETS

RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb | No. 1 Side Rails | Light Rails | Joint Bars | Track Spikes | Screw Spikes | tie Plates | Track Bars Treated |
|-----------------------------|---------------------|-------------|------------|--------------|--------------|------------|-----------------------|
| Bessemer U.I. | 4.45 | 5.35 | 5.425 | | | | |
| So. Chicago R3 | | | | 7.30 | | | |
| Endsley T2 | 4.45 | 5.35 | | | | | |
| Fairfield T2 | | 6.35 | | 7.30 | 5.275 | | |
| Gary U1 | 4.45 | 5.35 | | | 5.275 | | |
| Ind. Harbor I3 | 4.45 | 5.425 | 5.425 | 7.30 | | 5.275 | |
| Johnstown R3 | | 5.25 | | | | | |
| Joint U1 | | 5.25 | 5.425 | | | | |
| Kansas City S2 | 4.45 | 5.25 | 5.425 | | | 11.50 | |
| Lackawanna R3 | | | | 7.30 | 5.275 | | |
| Minnesota C6 | 4.45 | 5.85 | 5.425 | 7.30 | 5.275 | 11.50 | |
| Pittsburgh O1 | | | | | 11.00 | | |
| Pittsburgh P5 | | | | | 11.00 | | 11.50 |
| Pittsburgh J3 | | | | 7.30 | | | |
| Seattle R2 | | | | 7.60 | 5.425 | 12.00 | |
| Steddon R3 | 4.45 | 5.425 | | | | | |
| Struthers V1 | | | | 7.30 | | | |
| Torrance C7 | | | | | 5.425 | | |
| Williamsport S5 | 6.35 | | | | | | |
| Youngstown R3 | | | | 7.30 | | | |

| F.o.b. Mill Cents Per Lb | 22-Gage | Hot-Rolled (Cut Lengths)* | Cold-Reduced (Coiled or Cut Length) | |
|-----------------------------|---------|------------------------------|--|--------------------|
| | | | Semi- Processed | Fully Processed |
| Field | | | 8.925 | 8.225 |
| Armature | | | 8.50 | 8.75 |
| Elect. | | | 9.10 | 9.35 |
| Motor | | | 10.10 | 10.35 |
| Dynamo | | | 11.00 | 11.25 |
| Trans. 72 | | | 11.95 | 11.75 |
| Trans. 65 | | | 12.50 | 12.70 |
| Trans. 58 | | | 12.00 | Trans. 50 |
| Trans. 52 | | | 14.00 | Trans. 73 |

Producing points: Beech Bottom (W5); Braddock (A5); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandegrift (U1); Warren, O. (R5); Zanesville (A7).

* Cells 75% higher.

CLAD STEEL

| F.o.b. Mill Cents Per Lb | Stainless- Steel | Plate | Sheet |
|-------------------------------|---------------------|-------|--------|
| No. 304, 20 pct. | | | |
| Coatesville, Pa., L4 | | | *35.50 |
| Washington, Pa., J2 | | | |
| Clayton, Del., C3 | | | |
| New Castle, Ind., J3 | | | 32.50 |
| Nickel-carbon | | | |
| 10 pct., Coatesville, Pa., L4 | | | 39.50 |
| Incand.-carbon | | | |
| 10 pct., Coatesville, Pa., L4 | | | 47.90 |
| Mono-carbon | | | |
| 10 pct., Coatesville, Pa., L4 | | | 40.80 |

* Includes annealing and pickling, sandblasting.

WARE-HOUSES

| City | Delivery Charge | Sheets | | Strip | | Plates | | Shapes | | Bars | | Alloy Bars | | | |
|----------------|--------------------|------------|---------------------------|-------------------|-------------|------------|---------------|------------|---------------|-------------------|---------------|------------|---------------|--------------------|---------------|
| | | Hot-Rolled | Cold-Rolled (15 gauge) | Hot-Rolled | Cold-Rolled | Hot-Rolled | Cold-Finished | Hot-Rolled | Cold-Finished | Hot-Rolled | Cold-Finished | Hot-Rolled | Cold-Finished | Hot-Rolled | Cold-Finished |
| Baltimore | 5.20 | 6.22 | 7.51 | 7.78 | 6.89 | | 6.57 | 6.92 | 6.48 | 6.52 | | | | | |
| Birmingham | 15 | 6.35 | 7.35 | 8.25 | 6.60 | 9.00 | 6.65 | 6.65 | 6.50 | 9.00 | | | | | |
| Boston | 10 | 7.23 | 8.23 | 9.49 | 7.47 | 9.65 | 7.34 | 7.49 | 7.20 | 8.60 | 12.60 | 12.60 | 15.15 | 15.25 | |
| Buffalo | 20 | 6.35 | 7.48 ² | 8.60 | 6.78 | 6.45 | 6.70 | 6.70 | 6.55 | 7.05 | 12.50 | 12.30 | 14.85 | 14.95 ³ | |
| Chicago | 20 | 6.35 | 7.45 | 8.84 | 6.75 | 6.70 | 6.77 | 6.55 | 7.50 | 7.50 | 12.25 | 12.95 | 14.60 | 14.70 | |
| Cincinnati | 15 | 6.00 | 7.37 | 8.25 | 6.86 | 6.81 | 6.91 | 6.75 | 7.00 | 12.55 | 12.35 | 14.90 | 15.00 | | |
| Cleveland | 20 | 6.35 | 7.38 | 8.23 | 6.72 | 6.69 | 7.02 | 6.57 | 7.00 | 11.95 | 12.11 | | | 14.76 | |
| Denver | 8.15 | 9.15 | 10.37 | 8.40 | | 8.10 | 8.15 | 8.30 | 9.27 | | | | | 16.30 | |
| Detroit | 20 | 6.57 | 7.57 | 8.50 | 6.90 | 6.90 | 7.10 | 6.79 | 7.77 | 12.45 | 12.35 | 14.80 | 14.90 | | |
| Houston | 20 | 7.35 | 7.90 | 9.93 | 7.70 | | 7.35 | 7.60 | 7.70 | 9.50 | | 13.10 | | | |
| Kansas City | 20 | 7.05 | 8.05 | 8.95 | 7.29 | | 7.19 | 7.35 | 7.18 | 8.07 | | 12.27 | | | |
| Los Angeles | 20 | 7.50 | 8.35 | 9.95 | 7.85 | | 7.45 | 7.65 | 7.45 | 10.15 | | 13.35 | | 16.50 | |
| Memphis | 10 | 6.79 | 7.69 | | 6.90 | | 7.01 | 7.09 | 6.99 | 8.24 | | | | | |
| Milwaukee | 20 | 6.47 | 7.47 | 8.21 | 6.71 | | 6.61 | 6.80 | 6.60 | 7.69 | 12.34 | 12.16 | 14.69 | 14.79 | |
| New Orleans | 15 | 6.70 | 7.65 | 9.23 | 6.80 | | 6.90 | 7.05 | 6.80 | 7.70 | | | | | |
| New York | 10 | 6.97 | 7.76 | 8.79 ¹ | 7.36 | | 7.18 | 7.13 | 6.83 | 12.43 | 12.43 | | | 15.88 | |
| Norfolk | 20 | 7.00 | 8.00 | 8.99 | 7.10 | | 7.10 | 7.10 | 7.10 | 8.60 | | | | | |
| Philadelphia | 10 | 6.19 | 7.29 ¹ | 8.09 ⁴ | 6.96 | | 6.49 | 6.54 | 6.74 | 8.19 ³ | | | | 14.86 | |
| Pittsburgh | 20 | 6.35 | 7.38 | 8.30 | 6.72 | | 6.52 | 6.69 | 6.51 | 7.85 | 12.25 | 12.05 | 14.60 | 14.70 | |
| Portland | 20 | 7.60 | 8.75 | 9.05 | 7.85 | | 7.45 | 7.50 | 7.55 | 10.95 | | | | | |
| Salt Lake City | 20 | 7.65 | 10.20 | 10.70 | 9.65 | | 7.70 | 7.79 | 8.00 | 10.95 | | | | | |
| San Francisco | 20 | 7.55 | 8.95 | 9.35 | 7.90 | | 7.40 | 7.50 | 7.35 | 10.05 | | 13.35 | | 16.50 | |
| Seattle | 20 | 8.10 | 9.00 | 10.15 | 8.20 | | 7.80 | 7.75 | 7.80 | 10.95 | | 13.80 | | 16.45 | |
| St. Louis | 20 | 6.62 | 7.67 | 8.34 | 6.91 | | 6.81 | 7.09 | 6.80 | 7.89 | 12.54 | 12.34 | 14.84 | 14.99 | |
| St. Paul | 15 | 7.93 | 8.03 | 8.36 | 7.28 | | 7.19 | 7.25 | 7.16 | 8.26 | | 12.56 | | 15.21 | |

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) \$2.25 delivery. (4) 1000 to 1999 lb. \$2.25 delivery.

MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails | | Woven Wire Fence & 15 1/2 ga. | | Single Loop Ties | | Galv. Barbed and Twisted Barbless Wires | | Merchant Wire A.M.D. | | Merchant Wires Galv. | |
|----------------------|-------------------------|-----|----------------------------------|-----|------------------|------|--|-----|----------------------|-----|----------------------|--|
| | Col | Cal | Col | Cal | Col | Cal | Col | Cal | Col | Cal | Col | |
| Alabama City R3 | 137 | 146 | 155 | 159 | 6.30 | 7.30 | | | | | | |
| Aliquippa, Pa. J3 | 137 | 149 | 157 | 164 | 7.00 | 7.52 | | | | | | |
| Atlanta A8 | 139 | 151 | 157 | 164 | 7.00 | 7.55 | | | | | | |
| Bartonsville K7 | 139 | 151 | 157 | 164 | 7.00 | 7.55 | | | | | | |
| Buffalo W6 | | | | | | | | | | | | |
| Chicago, Ill. N9 | 137 | 149 | 156 | 162 | 6.90 | 7.30 | | | | | | |
| Cleveland A6 | 142 | 151 | 157 | 160 | 7.00 | 7.55 | | | | | | |
| Dayton A5 | 142 | 151 | 157 | 160 | 7.00 | 7.55 | | | | | | |
| Galveston D4 | 139 | | | | | | | | | | | |
| Houston S2 | 142 | 154 | | | | | | | | | | |
| Johnstown, Pa. B3 | 137 | 149 | | | | | | | | | | |
| Joliet, Ill. A5 | 137 | 146 | 155 | 159 | 6.90 | 7.30 | | | | | | |
| Kokomo, Ind. C9 | 139 | 148 | 157 | 161 | 7.00 | 7.55 | | | | | | |
| Los Angeles R2 | | | | | | | | | | | | |
| Kansas City S2 | 142 | 158 | 167 | 164 | 7.15 | 7.90 | | | | | | |
| Minneapolis C6 | 142 | 155 | 160 | 164 | 7.15 | 7.55 | | | | | | |
| Monessen P6 | 137 | 151 | | | | | | | | | | |
| Moline, Ill. R3 | | | | | | | | | | | | |
| Pittsburgh, Cal. C7 | 156 | 169 | 179 | 179 | 7.85 | 8.25 | | | | | | |
| Portsmouth P7 | | | | | | | | | | | | |
| Rankin, Pa. A5 | 137 | 146 | 145 | 155 | 6.90 | 7.30 | | | | | | |
| So. Chicago R3 | 137 | 146 | 145 | 155 | 6.90 | 7.30 | | | | | | |
| S. San Francisco C6 | | | | | | | | | | | | |
| Sparrows Pt. B3 | 139 | | | | | | | | | | | |
| Struthers, O. Y1 | | | | | | | | | | | | |
| Worcester, Mass. A5 | 143 | | | | | | | | | | | |
| Williamsport, Pa. S3 | | | | | | | | | | | | |

Col Nails, carloads, base \$8.30 per kg at Caneshocken, Pa. (A2).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

BOILER TUBES

| F.o.b. Mill | Size | | Seamless | | Elec. Weld | |
|------------------|-----------|------------|----------|-------|------------|-------|
| | OD In. | B.W. G. | H.R. | C.D. | H.R. | C.D. |
| Babcock & Wilcox | 2 | 13 | 28.33 | 33.97 | 27.48 | 32.95 |
| | 2 1/2 | 12 | 36.15 | 45.74 | 37.00 | 44.36 |
| | 3 | 12 | 44.05 | 52.82 | 42.72 | 51.23 |
| | 3 1/2 | 11 | 51.43 | 61.66 | 49.88 | 59.81 |
| | 4 | 10 | 68.29 | 81.88 | 66.24 | 79.42 |
| National Tube | 2 | 13 | 28.33 | 33.97 | 27.48 | 32.95 |
| | 2 1/2 | 12 | 36.15 | 45.74 | 37.00 | 44.36 |
| | 3 | 12 | 44.05 | 52.82 | 42.72 | 51.23 |
| | 3 1/2 | 11 | 51.43 | 61.66 | 49.88 | 59.81 |
| | 4 | 10 | 68.29 | 81.88 | 66.24 | 79.42 |
| Pittsburgh Steel | 2 | 13 | 28.33 | 33.97 | 27.48 | 32.95 |
| | 2 1/2 | 12 | 36.15 | 45.74 | 37.00 | 44.36 |
| | 3 | 12 | 44.05 | 52.82 | 42.72 | 51.23 |
| | 3 1/2 | 11 | 51.43 | 61.66 | 49.88 | 59.81 |
| | 4 | 10 | 68.29 | 81.88 | | |

Miscellaneous Prices

(Effective Mar. 1, 1955)

TOOL STEEL

| F.o.b. mill | | | | | |
|------------------------|----|-----|----|----|--------|
| W | Cr | V | Mo | Co | per lb |
| 18 | 4 | 1 | — | — | \$1.54 |
| 18 | 4 | 1 | — | 5 | 2.245 |
| 18 | 4 | 2 | — | 5 | 1.705 |
| 1.5 | 4 | 1.5 | — | — | .90 |
| 6 | 4 | 2 | 6 | — | 1.29 |
| High-carbon chromium | | | | | .73 |
| Oil hardened manganese | | | | | .405 |
| Special carbon | | | | | .37 |
| Extra carbon | | | | | .31 |
| Regular carbon | | | | | .26 |

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

| Per Net Ton | |
|---|----------------------|
| 6 to 24-in., del'd Chicago | \$111.80 to \$115.30 |
| 6 to 24-in., del'd N. Y. | 115.00 to 116.00 |
| 6 to 24-in., Birmingham | 98.00 to 102.50 |
| 6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less | \$129.50 to \$131.50 |
| Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in. | |

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.

Gross Ton

| | |
|------------------------|---------|
| Openhearth lump | \$11.15 |
| Old range, bessemer | 10.80 |
| Old range, nonbessemer | 10.15 |
| Measbl, bessemer | 10.05 |
| Measbl, nonbessemer | 9.90 |
| High phosphorus | 9.90 |

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

| Furnace, beehive (f.o.b. oven) | | Net-Ton |
|--------------------------------|--|--------------------|
| Connellsville, Pa. | | \$14.25 to \$14.50 |
| Foundry, beehive (f.o.b. oven) | | |
| Connellsville, Pa. | | \$16.50 to \$17.00 |
| Foundry, oven coke | | |
| Buffalo, del'd | | \$24.00 |
| Chicago, f.o.b. | | 24.50 |
| Detroit, f.o.b. | | 25.50 |
| New England, del'd | | 26.05 |
| Seaboard, N. J., f.o.b. | | 24.00 |
| Philadelphia, f.o.b. | | 23.00 |
| Swedesland, Pa., f.o.b. | | 23.00 |
| Painesville, Ohio, f.o.b. | | 25.50 |
| Erie, Pa., f.o.b. | | 25.00 |
| Cleveland, del'd | | 27.43 |
| Cincinnati, del'd | | 28.56 |
| St. Paul, f.o.b. | | 28.75 |
| St. Louis, f.o.b. | | 26.00 |
| Birmingham, f.o.b. | | 23.85 |
| Lone Star, Tex., f.o.b. | | 18.50 |

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

| GRAPHITE | | | CARBON | | |
|-------------|--------------|-------|-------------|--------------|-------|
| Diam. (in.) | Length (in.) | Price | Diam. (in.) | Length (in.) | Price |
| 24 | 64 | 20.50 | 48 | 100, 110 | 8.95 |
| 29 | 72 | 20.50 | 35 | 110 | 8.95 |
| 32 to 19 | 72 | 20.50 | 30 | 110 | 8.95 |
| 7 to 16 | 60 | 21.00 | 24 | 72 to 84 | 9.10 |
| 8 | 60 | 22.25 | 20 | 90 | 8.95 |
| 4 | 40 | 26.00 | 17 | 72 | 9.10 |
| 3 | 40 | 27.25 | 14 | 72 | 9.00 |
| 2 1/2 | 30 | 25.00 | 10, 12 | 80 | 10.50 |
| 2 | 34 | 45.00 | 8 | 80 | 10.50 |

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

| | | Discount |
|--------------------------------------|------|----------|
| Length | Case | C. |
| 1/4 in. & smaller x 4 in. & shorter | 2 | 22 |
| 1/4 in. & smaller x 6 in. & shorter | 3 | 18 |
| 9/16 in. & 5/8 in. x 6 in. & shorter | 4 | 17 |
| 1/4 in. & larger x 6 in. & shorter | 5 | 15 |
| All diam. longer than 6 in. | 15 | |
| 1/4 in. & smaller x 6 in. & shorter | 8 | 18 |
| Lag diam. x 6 in. & shorter | 8 | 19 |
| Lag, all diam. longer than 6 in. | 23 | 23 |
| Plow bolts | | |

Nuts, H.P., C.P., reg. & hvy.

| Discount | |
|----------|--------|
| Base | Case |
| 55 | 64 |
| 58 | 66 |
| 60 | 67 1/2 |

C.P. Hex regular & hvy.

| | | |
|-----------|----|----|
| All sizes | 55 | 64 |
|-----------|----|----|

Hot Galv. Nuts (all types)

| | | |
|--------------------------|----|--------|
| 5/8" or smaller | 38 | 50 |
| 5/8" to 1 1/4" inclusive | 41 | 53 1/2 |

Finished, Semi-finished, Slotted or Cassetted Nuts

| | | |
|-----------|----|----|
| All sizes | 55 | 66 |
|-----------|----|----|

Rivets

| | Base per 100 lb |
|----------------------|-----------------|
| 5/8 in. & larger | \$9.35 |
| 7/16 in. and smaller | 37 |

Cap Screws

| | Discount | H.C. Head | Bright | Treated |
|--------------------------------------|----------|-----------|--------|---------|
| New std. hex head, packed | | | | |
| %" x 6" and smaller and shorter | 38 | 38 | | |
| %" x 1" x 6" and shorter | 15 | 1 | | |
| New std. hex head, bulk | | | | |
| 5" x 6" and smaller and shorter | 50 | 42 | | |
| %" x 1" x 6" and shorter | 32 | 21 | | |
| • Minimum quantity per item: | | | | |
| 15,000 pieces 5/8" x 1" x 6" diam. | | | | |
| 200,000 pieces 7/16" x 1" x 6" diam. | | | | |
| 2,000 pieces 5/8" x 1" x 6" diam. | | | | |

Machine Screws & Stove Bolts

| | Discount | Mach. | Stove | Screws | Bolts |
|----------------------------|----------|-------|-------|--------|-------|
| Packaged, package list ... | 33 | 48 | | | |

| | Quantity | | |
|---------------------------------|------------------|----|----|
| 1/4-in. diam. | { 15,000- 99,999 | 17 | 59 |
| | 100,000-199,999 | 25 | 63 |
| & under 5/16-in. diam. & larger | 200,000 & over | 33 | 67 |
| 5/16-in. diam. & larger | { 15,000- 49,999 | 17 | 59 |
| | 50,000- 99,999 | 25 | 63 |
| All diam. over 3 in. | 100,000 & over | 33 | 67 |
| | { 5,000- 49,999 | 59 | |
| | 50,000- 99,999 | 63 | |
| long | 100,000 & over | 67 | |

Machine Screw & Stove Bolt Nuts

| | Discount | Hex | Square |
|------------------------|----------|-----|--------|
| Bulk, package list ... | 30 | 33 | |

| | Quantity | | |
|--------------------------|------------------|----|----|
| 5/16-in. diam. & smaller | { 15,000- 99,999 | 15 | 17 |
| | 100,000-199,999 | 23 | 25 |
| | 200,000 & over | 31 | 33 |

REFRACTORIES

Fire Clay Brick

| | Carloads per 1000 |
|--|-------------------|
| First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00) | \$114.00 |
| No. 1 Ohio | 107.00 |
| Sec. quality, Pa., Md., Ky., Ill., 98.00 | 98.00 |
| No. 2 Ohio | 95.00 |
| Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50) | 17.00 |

Silica Brick

| | Carloads per 1000 |
|------------------------------|-------------------|
| Mt. Union, Pa., Ensley, Ala. | \$120.00 |
| Childs, Hays, Pa. | 125.00 |
| Chicago District | 130.00 |
| Western Utah | 135.00 |
| California | 140.00 |

Super Duty

| | Carloads per 1000 |
|----------------------------------|-------------------|
| Hays, Pa., Athens, Tex., Windham | 137.00 |
| Curtner, Calif. | 155.00 |

| | Carloads per 1000 |
|--|-------------------|
| Silica cement, net ton, bulk, Eastern (except Hays, Pa.) | 20.00 |

| | Carloads per 1000 |
|---|-------------------|
| Silica cement, net ton, bulk, Hays, Pa. | 22.00 |

| | Carloads per 1000 |
|--|-------------------|
| Silica cement, net ton, bulk, Chicago District | 21.00 |

| | Carloads per 1000 |
|--|-------------------|
| Silica cement, net ton, bulk, Western Utah | 22.00 |

| | Carloads per 1000 |
|--|-------------------|
| Silica cement, net ton, bulk, California | 23.00 |

Chrome Brick

| | Per net ton |
|--|-------------|
| Standard chemically bonded, Balt. | \$86.00 |
| Standards chemically bonded, Curtner, Calif. | 96.25 |
| Burned, Balt. | 80.00 |

Magnesite Brick

| | Carloads per 1000 |
|----------------|-------------------|
| Standard Balt. | \$109.00 |

| | Carloads per 1000 |
|--------------------------|-------------------|
| Chemically bonded, Balt. | 97.00 |

Grain Magnesite

| | St. 1/4-in. grains |
|-------------|--------------------|
| Domestic, f | |

Stonehouse

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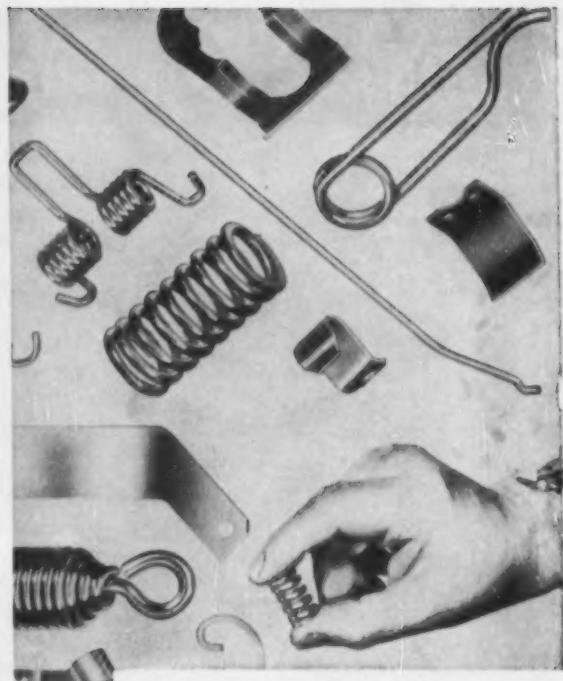
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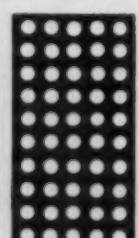
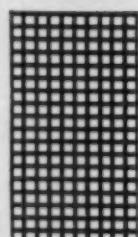
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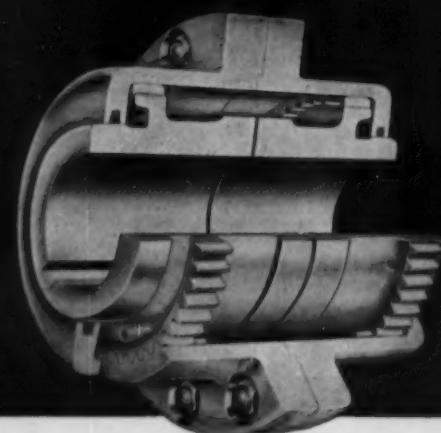
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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Sales Spurt . . . Used machinery sales in the Cleveland area have made a good spurt this year and the trend promises to continue. A leading dealer last week explained it this way:

"When business is going up or down, we just kind of stand still. After you have a sustained improvement in general industrial operations like we've had since fall, it begins to catch up with us a few months later."

"That time has now arrived in Cleveland and generally in Ohio and we're beginning to feel the push. Most of it is for general toolroom equipment, principally from subcontractors. Automotive parts suppliers are the main segment, followed closely by aircraft and sheet metal fabricators of all types."

Replace Oldtimers . . . A good part of the business is in replacing machinery 50-60 years old with postwar models at considerable savings. Savings over comparable new models occasionally are well over 50 pct from the purchaser's standpoint. Yet the machines can hold necessary tolerances and, of course, production rates are far beyond the oldtimers. The older machines are also usually scrapped, eliminating the trade-in problem for the dealers.

A good portion of the market for machine tools is coming from larger firms which have received new defense contracts, mainly for

aircraft engine parts and accessories. Collection on the machinery is also good from the dealer's standpoint since the government generally finances the equipment.

Surplus Good Source . . . Dealers are also finding a plentiful supply of reconditionable machine tools from government surplus auctions. Dealers' desks are flooded daily with notices of these and bidding is not too competitive, especially on special machines which can be adapted to standard production or universal models with a little work.

Detroit automotive plants are also unloading heavy supplies of machine tools. Consolidations among auto manufacturers have thrown large supplies on the market, both from the companies themselves and their suppliers.

Machine tools from auto plants, however, do not find too good a market if their origin is known. In the all-out emphasis on production in Detroit, the beating the machinery takes and high turnover rates are too well known. Extensive reconditioning must generally be done before they can be re-sold. In addition most are usually highly specialized.

Push Tax Change . . . Machinery Dealers National Assn. is pushing for tax revisions based on faster depreciation of used machine tools. Association spokesmen say the firm buying used machinery is handicapped.

Sales Trends in Used Machinery Industry

(Based on survey* of 93 used machinery dealers)

| Quarter | Composite Sales | | Change | |
|---------|-----------------|--------------|---------------|-------|
| | 1953 | 1954 | Dollar | Pct |
| 1st | \$ 7,511,246 | \$ 5,464,436 | -\$ 2,046,810 | -27.2 |
| 2nd | 6,878,110 | 5,339,558 | -\$ 1,538,552 | -22.4 |
| 3rd | 5,892,781 | 4,491,299 | -\$ 1,401,482 | -23.8 |
| 4th | 5,701,156 | 4,229,475 | -\$ 1,471,681 | -25.8 |
| Total | 25,983,293 | 19,524,768 | -\$ 6,458,525 | -24.9 |

*Study was made by Machinery Dealers National Assn. Statistics cover only dealer-to-user sales of used equipment.

THE CLEARING HOUSE

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS

5" x 1/2" Bortech Initial Type Bending Roll—LATE
5" x 1/2" Bortech Initial Type Bending Roll
10" x 1/2" Bortech Initial Type Bending Roll
20" x 1" Billes & Jones Pyramid Type Bending Roll

BRACKES—LEAF TYPE

5" x 1/2" Drels & Krump Size 100
10" x 1/2" Drels & Krump Size 200
12" x 1/2" Drels & Krump, Motor Driven

BRACKES—PRESS TYPE

Model B-178 Versen All Steel, Capacity 12 1/2"
Cincinnati All Steel Press Brake 10 1/2"

CRANES—OVERHEAD ELECTRIC

TRAVELING

5 ton P&H Trav-Lift 20' Span 220/440 A.C.
8 ton P&H Trav-Lift 20' Span 440 Volt A.C.
10 ton P&H 20' Span 220/440 A.C.
10 ton Shepard-Niles 40' Span 220/440 A.C.
10 ton Shepard-Niles 48" Span 220 Volt D.C.
10 ton Harmschfeger 50' Span 220/440 A.C.
10 ton OETZ 45' Span 220/440 A.C.
10 ton Case 40' Span 220 Volt D.C.
10 ton P&H 40' Span 220 Volt D.C.
With 5 ton 440 AC Generator Set
25 ton P&H With 5 ton Auxiliary 60' Span 220 Volt D.C.
20 ton Whiting 60' Span 220 Volt D.C.
50 ton Niles 60' Span 220/440 A.C.
125 ton Cleveland 60' Span 220 Volt D.C.
With 2 Trailers 42 1/2 ton & 10 ton Aux.

CUT-OFF MACHINE

Taylor Wilson Cut-off Machine, Capacity 2 1/2" by 1/2" Complete with Hyd. System & Elec. Equip.

DRAW BENCHES

25,000 lbs. Chain Draw Bench, 41' Length of Draw
10,000 lbs. Pendo Draw Bench, Max. length of bar 28'
With draw up to 4 1/2" max. round

FORGING MACHINES

1" x 1 1/2" Acme
5" x 10" AJAX with Air Clutch
1" x 1 1/2" W. & N. National
1 1/2" x 2" National
1 1/2" National—Alt. Clutch

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Work Dimensions 45" x 60", 60" Piling Height

FURNACE—HEATING

Rockwell Rotary Hearth Gas Fired Forge Furnace

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36" & 42" Bullard vertical turret lathes.
No. 2 P. & W. Jig Borer, Model 1278.
5" Bar Yoder, table type, 1942.

DRILLING MACHINES

4" arm 13" est. Carlton radial, P.F., P.E.
8" arm 16" est. American radial, H.D.

GRINDING MACHINES

40" x 16" Blanchard 2-spd. rotary, new 1946.
72" Hanabell 3-spd. rotary surface, new 1946.
8" x 18" Landis cyl. 30 deg. 40, 1941.
10" x 30" Landis gap type cylindrical, new 1941.

LATHES

No. 5 Jones & Lamson ram type univ. turret (2) lats.
14" x 30" Monsey Turret, 1940.
18" x 36" Monsey Turret, 1942.
18" x 30" Lipe Corro-Matic, 1942.
24" x 36" Monarch Turret, 1942.
No. 5 Gisholt, Pre-Selector, univ., new 1942.

MILLS

1-1/2 & 2-1/2 Cincinnati production.
1-2-3-4-5-6 kmt. type plain & vertical.
No. 38 Bremec 40" x 12" 1942.
24" x 34" x 12" Ingersoll edg. rail planer type, 1946.
42" x 42" x 18" Ingersoll edg. planer type.
60" x 48" x 16" Ingersoll edg. rail planer type.
No. 2H K & T plain horiz., new 1942.

PRESSES

12 1/2" Drels & Krump bending brake.
10 ton No. 7 1/2 Verona OBI (2) 1940.
100 ton No. 200 Toledo OBI, D.C., cushion.
100 ton 7046 Verona Gap Frame.
100 ton No. 15-1 Cleveland OBI, lathe type.
500 ton No. 1000 Hamilton OBI, adj. bed 60" x 102".
400 ton 800 Toledo K-J scaling or embossing.
500 ton Baldwin Southwark HYSPED Hyd., 1948.
1000 ton No. 600 Toledo scaling or forging.

SHAPERS

5" x 6" G & E Invincible, F.M.D., lathe type.

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45" McKay—Rolls 2 1/2" Dia.
54" Astor Standard 17" Rolls 4 1/2" Dia.
72" H & J 8 Rolls 4 1/2" Dia.
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100 ton Universal 32 Work Rolls 2 1/2" Dia. Capacity 25 to 30 Gauge Mild Steel

MULTISLIDE MACHINE

500 U. Multislide Max. width of stock 4 1/2" by .005 thick. Edgewood Stock Straightener

PLATE DUPLICATOR

Thomas Machine Mfg. Co. Plate Duplicator. Handles Plates 6" x 15". Punch Capacity 9" Hole through 1/2" Plate

PRESSES—HYDRAULIC

100 ton Southward 4-Column, 14" Stroke Plates 18" x 34"

500 ton Wood 4 Columns, 24" Stroke, 72" x 96" Between Columns

PRESSES—STRAIGHT SIDE

\$307A Bliss Double Geared, 6" Stroke, Bed Area 38" x 42"

PRESSES—TRIMMING

No. 7450 Billed 20 ton, 4" Stroke, 18" Shut Height
No. 7450 Billed 20 ton, 4" Stroke, 18" Shut Height
No. 87 Toledo 150 ton, Bed Area 44" x 27"

PUNCH & SHEAR COMBINATIONS

20" P&H Ingersoll, Capacity Punch 1-8/16" x 1".
Shear 2" x 8" x 2 1/2" Id., Angles 6x6x5/8"

52" Long & Alstott Double End, Punch 1" x 1"

55 Wickes Single End 42" Thread 1 1/2" x 1" Style W Cleveland Single End, 60" Thread, 312 Ton With Attainment for Dishing Heads

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Torington London Flattening Mill with Edge Conditioning Rolls, Flattening Rolls 5" x 4"

7 1/2" Stetzel Four High Rolling Mill

8" x 12" Blatz & Johnson Single Stand Two High

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12" x 18" Waterbury Farrel Temper Mill

12" x 18" Philadelphia 3-High Cold Rolling Mill

16" x 20" Lewis Two High Two Stand 20" x 30" Pacific Two Stand Two High

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50" x 1 1/2" Pels

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11" x 1 1/2" Pels

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6x6x5/8" Miles & Jones

6x6x5/8" Long & Alstott Biss B

6x6x5/8" Long & Alstott Biss C

SHEARS—BILLET

No. 8 Buffalo Billet Shear, Motor Driven. Capacity 2 1/2" x 12 1/2" Id., 9x10" Flat

20" x 8" 20" Club Shear, Motor Driven

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3/4" Quickwork Rotary Shear, 20" Thread

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8" x 8/16" Niagara 15H, Motor Dr. NRW 1951

10" x 10" 10" x 10" 10" x 10" 10" x 10" Motor Driven

12" x 12" 12" x 12" Niagara 2510-B

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15" x 15" Birdsbore

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20" Stimate Heavy Duty Slitter

20" Yoder Coil Slitting Line, Uncoiler & Reeler

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22" Yoder Coil Slitter

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Machine. Capacity 5/8" to 1 1/2" Dia. Bars up to 10" or up to 12" Tubing, Motor Driven

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48" Cleveland Punch & Shear Works Strip Straightener & Cutting Machine

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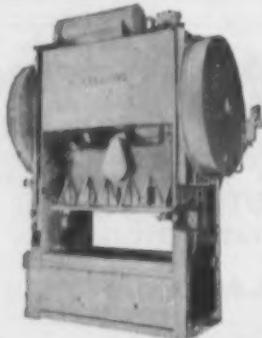
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Press 700 Ton Cap., Bed Area 60" F.B. x 72"
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 3—4-HIGH HOT STRIP MILL STANDS for up to 48" width.
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 I—18" BAR MILL, 3-HIGH, single stand, with drive motor, tables, billet heating furnace, etc.
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 2—PACK FURNACES for hot sheet mills, 62" x 60", double chamber.
 I—STAMCO #6 CORRUGATING MACHINE for sheets, removable dies.
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Constant Duty—3 phase 60 cycle

| Qu. | HP | Make | Type | Volts | RPM |
|-----|------|--------|---------|-----------|------|
| 1 | 1500 | G.E. | MT-698 | 2300 | 357 |
| 1 | 1200 | G.E. | MT-26 | 5150/2300 | 360 |
| 1 | 1200 | G.E. | MT-25 | 2300 | 377 |
| 1 | 100 | G.E. | MT-25 | 2300 | 480 |
| 1 | 200 | AL-CH. | ANT | 2300 | 314 |
| 2 | 200 | G.E. | 1-16-M | 2300 | 450 |
| 1 | 600 | G.E. | MT-412 | 2300 | 450 |
| 1 | 550 | G.E. | MT-414 | 2300 | 450 |
| 1 | 250 | G.E. | MT-414 | 2300 | 450 |
| 1 | 250 | G.E. | 1-17A-M | 2300 | 450 |
| 1 | 150 | AL-CH. | ANT | 450 | 720 |
| 1 | 125 | G.E. | MT-587 | 2300 | 1390 |
| 1 | 100 | G.E. | 1-15A-M | 2300 | 450 |

SQUIRREL CAGE MOTORS

3 phase 60 cycle

| Qu. | HP | Make | Type | Volts | RPM |
|-----|-----|--------|----------|-------|------|
| 1 | 400 | G.E. | 1-K | 2300 | 314 |
| 1 | 500 | Whs. | CH-580 | 2300 | 1750 |
| 1 | 500 | Whs. | CH-573-C | 2300 | 1750 |
| 1 | 500 | AL-CH. | AB | 450 | 880 |
| 1 | 125 | AL-CH. | AB | 2300 | 1750 |
| 1 | 125 | AL-CH. | AB | 2300 | 450 |
| 1 | 100 | Whs. | CH-688 | 450 | 1750 |
| 1 | 100 | G.E. | KT-588 | 450 | 370 |
| 1 | 100 | Whs. | CH-688 | 2300 | 450 |
| 1 | 75 | AL-CH. | AB | 2300 | 450 |

SYNCHRONOUS MOTORS

2 phase 60 cycle

| Qu. | HP | Make | PF | Volts | RPM |
|-----|------|------------|-----|-----------|------|
| 1 | 2000 | Whs. | AB | 4800/2400 | 720 |
| 1 | 2100 | G.E. | 108 | 2300 | 950 |
| 1 | 2000 | G.E. | 90 | 2300 | 1150 |
| 1 | 1750 | G.E. | 100 | 2300 | 880 |
| 1 | 750 | G.E. | 90 | 2300 | 450 |
| 1 | 710 | G.E. | 88 | 2300/440 | 720 |
| 1 | 400 | G.E. Mels. | AB | 440/220 | 900 |
| 1 | 250 | G.E. | 88 | 440/220 | 900 |
| 1 | 250 | G.E. | 100 | 2300 | 514 |
| 1 | 230 | Whs. | AB | 440 | 900 |
| 1 | 300 | Whs. | AB | 440 | 1750 |
| 1 | 187 | G.E. | 88 | 440 | 720 |
| 1 | 150 | G.E. | 100 | 2300 | 900 |
| 1 | 125 | G.E. | 90 | 2300 | 1150 |
| 1 | 125 | G.E. | 88 | 440/2200 | 1250 |
| 1 | 100 | G.E. | 88 | 440 | 1800 |
| 1 | 100 | Whs. | AB | 440 | 880 |
| 1 | 100 | G.E. | 88 | 440 | 880 |

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3 phase—60 cycle

| Qu. | H.P. | Make | Type | Volts | Speed |
|-----|------|---------|---------|-------------|-------|
| 1 | 1500 | G.E. | MT-498 | 2300 | 360 |
| 1 | 1500 | ABB | | 2300 | 720 |
| 1 | 1500 | G.E. | MT | 2300 | 275 |
| 1 | 1000 | A.C. | M181 | 2300 | 240 |
| 1 | 1000 | G.E. | MT-488 | 2300 | 360 |
| 1 | 500 | G.E. | M-374Y | 2300 | 600 |
| 1 | 500 | Whs. | CY | 550 | 350 |
| 1 | 400 | G.E. | IM | 440 | 720 |
| 1 | 400 | Whs. | CW-900A | 440 | 1170 |
| 1 | 400 | Whs. | CW-1212 | 2300 | 435 |
| 1 | 250 | G.E. | MT-540Y | 3000/2300 | 2170 |
| 1 | 250 | G.E. | IM-17A | 440/2300 | 720 |
| 1 | 250 | G.E. | MT-424Y | 4000 | 257 |
| 1 | 250 | G.E. | MT-550B | 3000 | 1860 |
| 1 | 250 | AL-CH. | | 880 | 600 |
| 1 | 200 | Cr. Wh. | SQOB | 440 | 505 |
| 1 | 200 | G.E. | IM-17 | 440 | 415 |
| 1 | 200 | G.E. | IM-507 | 440 | 1160 |
| 1 | 150 | Whs. | CR-650B | 440 | 880 |
| 1 | 150 | Whs. | CR-650 | 440 | 580 |
| 1 | 150 | G.E. | IK | 440/600/450 | 2300 |
| 1 | 150 | AL-CH. | ARW | 2300 | 1750 |
| 1 | 450 | C.W. | 2501-BL | 13800/6300 | 514 |
| 1 | 450 | G.E. | TR | 2300 | 257 |
| 1 | 310 | G.E. | ATI | 2300 | 360 |
| 1 | 275 | G.E. | ATI | 2300 | 1600 |
| 1 | 2000 | Whs. | TR | 2300 | 120 |
| 1 | 725 | G.E. | ATI | 3300/15000 | 600 |
| 1 | 500 | Ideal | SM | 2300/4100 | 1800 |
| 1 | 500 | Whs. | TR | 440 | 900 |
| 1 | 450 | Whs. | TR | 2300 | 115 |
| 1 | 450 | Whs. | TR | 2200 | 450 |
| 1 | 400 | G.E. | TR | 2200 | 400 |

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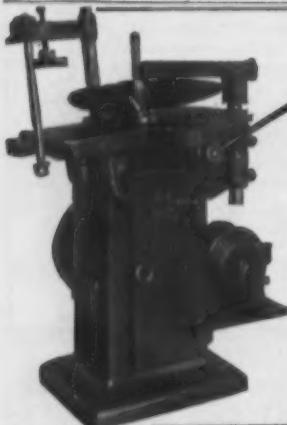
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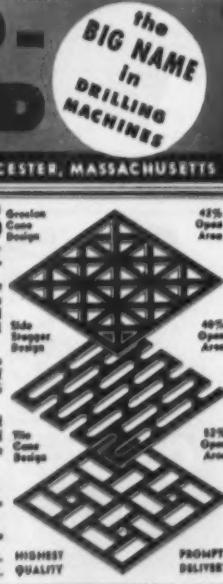
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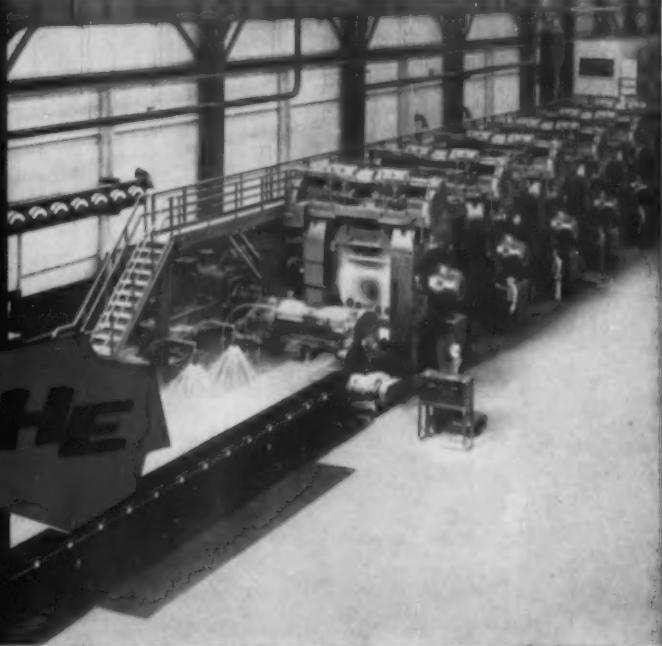
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